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THE AMERICAN GAS LIGHT JOURNAL

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DEVOTED TO THE INTERESTS OF ILLUMINATION, HEATING, MECHANICAL, CHEMICAL AND GENERAL SCIENCE.

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[Special Editorial Correspondence: By Telegraph.]

THE SOUTHERN GAS ASSOCIATION'S THIRD MEETING.

THE EXCHANGE HOTEL, MONTGOMERY, ALA., April 19, 1911.

Dear JOURNAL: Over 100 good gas men and true are here, each convinced that "into each life some rain must fall." 'Tis falling all right; but rain as it did not a bit of dampness showed in the ardor displayed by the delegates present, who represented the "pick of the South," with a few "picked ones" from elsewhere. President W. H. Frund was unavoidably delayed in reaching here, so the first day's proceedings were ably conducted by Vice-President Hoyt. The splendidly appointed assembly room in this beautifully kept, excellently conducted hostelry, was well peopled by delegates when Chairman Hoyt introduced the Hon. W. A. Gunter, Jr., President of the City Commissioners, whose welcoming speech was loudly punctuated by the fast falling rain. However, the keys of the city were prevented from tarnishing. Secretary Ferrier (and he must be a charmed one) looking not at all as though he had just emerged from a severe illness, was as busy as a cricket, but that did not prevent him from joining in the cheering which greeted the close of Commissioner Gunter's speech and the Texas man's (Mr. H. M. Moore, of Austin) clever response thereto. The Presidential message was read by Chairman Hoyt—and a right good reader he is—after which followed the announcing of several messages from different Boards of Trade throughout the South asking the Association to "come to their alley" next year. Of course, it is quite premature to guess over the picking just now; but it does look that that diplomatic Hoyt person will win with and for Jacksonville, on the St. Johns. Meanwhile the indefatigable Rushin, of Atlanta, was booming Georgia's beautiful city as the proper place for holding the 1912 meeting of the National Commercial Gas Association, and actually succeeded in getting the Southern Association to officially and emphatically indorse the idea. The paper list was taken on in the following order: "Commercial Lighting," by Mr. J. N. Cooke; "The Inspection of Consumers' Gas Appliances," by Mr. F. G. Dean; "The All-Gas Kitchen," by Mr. G. M. Howsmon; "Advertising," by Mr. A. E. Kelley; "Water Heaters: Automatic, Instantaneous, Circulating," by Mr. W. J. McCartney; and "Applications of Gas Fired Boilers," by Mr. W. G. McKee—in the absence of the author the paper was read by Mr. J. F. Parker. It is my pleasant task to say that these communications were really of a high order, each having forceful points that invoked good, useful discussion. It may also be taken for granted that all these took up every minute of the business time of the first day nor was anything slurred or slighted. The "gas show" is really a creditable one, and the lighting of the showroom, and the externals as well, is artistic and satisfying. It has been planned and carried out in a division of the whole between the General Gas Light Company and the Welsbach Lighting Company. It has so many meritorious and praiseworthy features that I shall not attempt to here describe it in the space at command. It is well worthy of a separate article, so let it suffice now to say that all Montgomery is surprised at what can be accomplished by gas as an illuminant. The show proper has 20 exhibits, all well placed and manned. For to-morrow (it is really to-day) the 20th, the programme calls for a theater party for the ladies (many of whom are present) while their other selves are enjoying a "Smoker." The weather cleared later, and I think it is safe to say that a more awestruck resident of the South cannot be found than when one encounters a native colored gentleman—they are positively astounded at this remarkable invasion of white people.—W.

MONTGOMERY, ALA., April 21, 1911.

Dear JOURNAL: Friday morning (7 o'clock), with visions of Jackson's Lake confronting us, and a Southern sun warming everyone up. Time and other factors being given due consideration, and, verily, with the warning of your composing room chief ringing in my ears the well-known cry, "Forms go at 2:30," I'll be brief in my accounting of yesterday's transactions. President Frund got in Wednesday night, and the proceedings of the following day were conducted (and well conducted) by him in excellent way. The opening number was Mr. Norman Macbeth's illustrated lecture on "Gas Illumination." It is needless to say that his subject was intelligently and interestingly treated. Then, in order, the following papers were considered: "Relation of the New Business Department to the Gas Company," by George Williams—an admirably put together document it is; "Street Main and Service Construction Policy," by K. L.

Simons; "Starting a Gas Company," by J. C. Storm—unfortunately the author from Texas was unable to attend, so Secretary Ferrier read the text: "High Pressure Gas Plant with Medium Pressure on Mains," by F. H. Sawyer - this paper will be perused later on with interest by every reader of the JOURNAL; and the list was exhausted when the paper by Mr. A. W. Young, on "Shop Management," was discussed. The regular technical business having been completed, the members adjourned to witness the working of a novel cooking class plan that is conducted by the local Company. On the second floor of its handsome office building a large room is fitted up in kitchen cabinet style complete, the main features being a cabinet gas range and a modern ice box. Here, every Thursday afternoon in the year, demonstration lessons in cooking by gas are given by Miss Isabella Laws, whose classes seldom number less than 200, all negresses—possibly two-thirds the number are fairly finished in the cooking art, the others being novices. The lectures are given in series of 10, in successive order. The lecture lasts 2 hours *each* day, and at its conclusion the foodstuffs as cooked are distributed to the—"Students," shall I call them. I know the hour I spent in watching the proceedings was well spent; and never have I beheld pupils who gave greater heed to their teacher. Every expense, of course, is borne by the Company. At 7 P.M. we "sat in" the "Banquet Smoker," close to 200 gracing "the board," which was "planked" in the room that had served us as a meeting room. But, hark! Prior to the gustatory joys, appetites were whetted by a happening of the sort which tries men's souls. Far be it from me to divulge the terrible truth; but those who wish to run the thing to earth may hearken up George Williams—the sapient sage of the house of H. L. Doherty & Co., or else of that chaste sphinx, T. C. Rushin, of Atlanta. Luckily for all, J. F. Parker, of Rockford, the "Strong Man" of Illinois, was enabled through superb strategy to vanquish vice and reward virtue. However, the *contretemps* caused one to leave town on the first freight, and the pulsing of several others is still well above the 100 mark. The "banquet-smoker" was a great success. The menu was excellent, the special full dress features—particularly *les chapeaux grotesque*—were whimsical, the speeches were pointed, witty and short; but perhaps the crowning glory of the occasion was the touchingness of the poem recital by Jno. F. Parker, which actually places even the "Alabama Dog" in a niche in the Hall of Fame. Seldom indeed was an evening more enjoyably spent. Of course, I will not be able to tell you anything about our trip for this day to Jackson's Lake, in which well-known outing resort some of us at least will share in an initial barbecue. Nor can I register that which will be done from a business point of view. However, I will likely not be wide of the mark if I venture to say these results will ensue. The officers chosen will be:

President.—Mr. H. B. Hoyt, Jacksonville, Fla.
First Vice-President.—Mr. C. E. White, Montgomery, Ala.
Second Vice-President.—Mr. James Ferrier, Rome, Ga.
Secretary-Treasurer.—Mr. E. D. Brewer, Atlanta, Ga.

Too bad that the only Ferrier concluded that someone else should take up the routine burden. However, Brother Brewer is a "sure enough" worthy successor. And Jacksonville, Fla., certainly has the call "next place" of meeting. The story of the barbecue will have to be "told in our next," so here's off for it in royal style. Well, indeed, to fame and friendship does the Southern Gas Association progress, for within it is unity of purpose guided by sincerity of direction.—W.

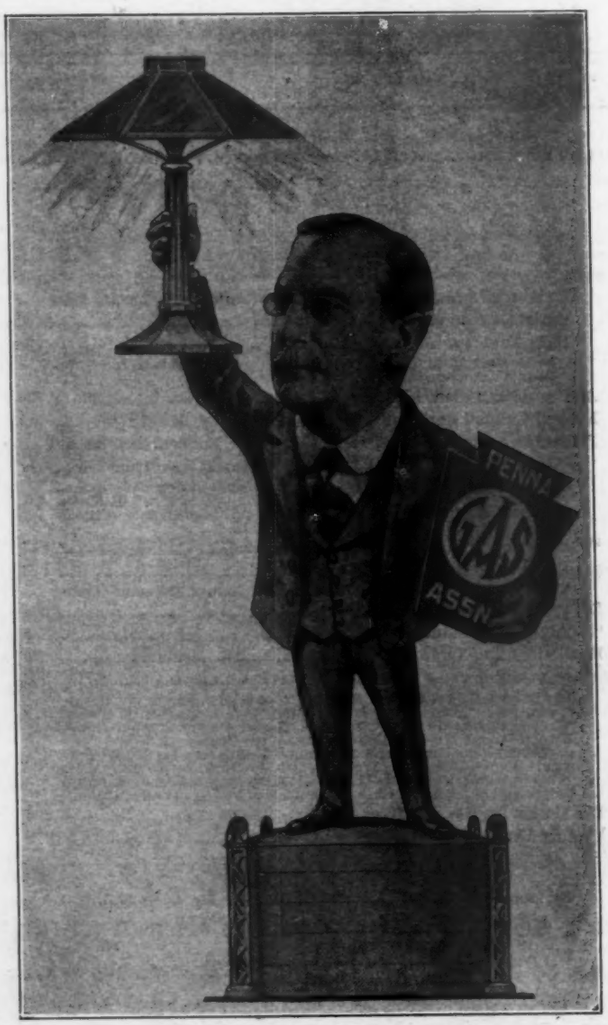
BRIEFLY TOLD.

THE MEETING OF THE MISSOURI ASSOCIATION.—Our special correspondent, in reporting the doings at the meeting of the Missouri Electric, Gas, Street Raiway and Water Works Association (Springfield, Mo., second week of April), says: "There was nothing of moment at our meeting subsequent to my telegram. The by-laws were amended to admit to membership representatives of municipally owned plants. The dues were adjusted at a figure not to exceed $15, regardless of size of town. The next place of meeting will be Joplin, and the officers elected were:

President.—F. E. Murray, Louisiana.
First Vice-President.—P. A. Bertrand, Jefferson City.
Second Vice-President.—J. E. Harsh, Joplin.
Third Vice-President.—C. L. Cleary, Sikestown.
Treasurer-Secretary.—N. J. Cunningham, Springfield.

Two exceptionally fine papers were read, respectively, by E. A. Flower (Columbia University), on 'Lubrication,' and on 'Illuminating Engineering,' by H. Spoehrer, of St. Louis. At the banquet, Mr. W. D. A. Ryan, of the General Electric Company, addressed the delegates on the subject of 'Street Lighting,' the talk being beautifully illustrated by means of 125 stereopticon views. He complimented St. Louis on its systems of street lighting, and gave it as his opinion that the lighting of the beautiful thoroughfare, Broadway, St. Louis, was superior to that seen in any other city in the world. A 'Commercial Man's League,' composed of all the utility companies of St. Louis, took entire charge of the entertainment, and did it well. The organization is in a flourishing condition, and it is the opinion of the officials that the membership will be doubled within the year." In connection with this meeting we wish here to acknowledge especial indebtedness to the courtesy of Mr. N. J. Cunningham.

SIDE LIGHTS ON THE PENNSYLVANIA'S CONVENTION.—No story of the doings at Reading during the sessions of the Pennsylvania Association would be half complete without some comment upon the efforts of the town's people to make the "stay" a pleasant one. In addition to the efforts of those connected with the local Company, mention should be made of the fact that the automobiles used on the delightful excursion, were donated by a number of residents who sent many handsome cars. The latest recruit among Pennsylvania managers, Mr. J. E. Philbrick, received much attention from those in attendance. If he bowls out as many over-enthusiastic appliance salesmen as he bowled over "pins" with "young" Young as a partner, he will be going some. Even Rhodes could not beat him. Souvenirs were distributed by the W. M. Crane Co., and the Connelly Iron Sponge and Governor Co. The stickpins of the former will undoubtedly be worn, and the latter's pencils were used to advantage. The "lid" of the banquet menu is reproduced, wherefore the able, far-sighted



and industrious President Keppleman will be readily recognized by all who know him. The badge is one of the most attractive of any of the Gas Association distinctive markings, and, with Secretary Merritt as first officer, these will be worn by nearly all the gas men of the State before the year closes. The need of a large and active association was brought out in a delightful but none the less forceful manner by Director Jones in his speech at the banquet. In times of stress and of political agitation against corporations the men in charge of them must stand together, not only passively but actively. Those Pennsylvanians who have remained in the background should get in touch with John H. Keppleman without further delay. There are 85 plants in Pennsylvania, only 35 of which are represented in the Association, so there is considerable missionary work ahead if the gas men are to present a solid and prevailing front against the attacks of the demagogues.

CURRENT MENTION—

MR. GEORGE G. RAMSDELL, having disposed of his interest in the Ramsdell Inverted Gas Lamp Company, has resigned as President and Director thereof. The business of the Company will be continued at the Waterbury (Conn.) headquarters, the stock being now owned by the Novelty Manufacturing Company, which concern has for several years been manufacturing the Ramsdell lamp.

Address of the President (Mr. John H. Keppelman) of the Pennsylvania Gas Association, on the Occasion of Its Third Annual Meeting, Reading Pa., April 12 to 14, 1911.

This is the third meeting of an Association which, I believe, has great things before it, both for its individual members, in point of pleasure and agreeable intercourse, and also for the promotion and advancement of intelligent uniformity in the manufacture and distribution of gas throughout the State. The pleasure in the one and the necessity for the other are abundantly emphasized by the existence of this Association and the presence of so large a membership at this meeting.

In any discussion of the service of public utilities, whether railroad, street railway, electricity, telephone. telegraph, water or gas, some problems are so obviously part and parcel of the business that their solution lies only in obedience to long established and fixed practices. more properly designated as founded in common sense, while others are susceptible of solution by the adoption, from time to time, of such new methods as appear to result in greater efficiency than established practices are capable of yielding. I know of no better example of the former than the relation of the company to the consumer.

The relation between the company and its consumers, whether collectively or individually, is, in a restricted sense, the same as the much discussed relation of a public utility company to the public. In passing, let me point out how inevitably most matters connected with this aspect of public service companies ultimately come to the consumer. The State is composed of individuals who are its qualified citizens. The State, through the representatives chosen from and by these citizens, grants to other persons, being more often a few of their own number, a special privilege which we call a franchise, which entitles those select few to the exercise of a right (the manufacture and sale of illuminating gas for instance) which is not enjoyed by the others. In other words, we find certain persons of a given group engaged in a business relation with others of the same group, which relation is the result of a privilege conferred by the entire group. To be sure, as a matter of law, a corporation is created with a personality of its own, and having rights and being subject to liabilities not before attaching to any of the individuals. In reality, however, the corporation is but a means by which a group of men do business as a single individual. The exercise of the franchise of a public service corporation is, therefore, merely a business method by which individuals deal with each other, in much the same manner as they would be dealing were they engaged in any other kind of intercourse. The fact that they possess a special privilege conferred by the State gives them no right, other than such as may be deemed to exist in law, to employ any other methods than those prevailing in personal business relations between man and man. A gas company, like all other companies engaged in the service of public utilities, is entitled to a fair return upon its investment. It is engaged in just as much a commercial enterprise as the grocer. The temptation to abuse the company's powers to the detriment of the consumer should be restrained by such business conduct as is calculated to make the consumer the company's best advertisement. The innumerable complaints made by consumers, whether honestly or dishonestly, not to speak of the equally innumerable efforts on the part of certain classes of consumers to "beat" the company, make it exceedingly difficult at times to realize that the consumer is entitled to ordinary courtesy. The consumer evidently forgets that the company is composed of men equally human and entitled to equal considerations with himself, and seems to feel that, because he is dealing with a soulless corporation, he is dealing with soulless and spiritless individuals. In this, perhaps, the consumer is not to be altogether blamed, particularly in the light of the great friction which exists between the public service corporation and the public. Fortunately, however, it lies within the power of a company to remove the friction, and the only way in which this can be done is by giving the consumer good service. It is but a few years since the consumer was to a considerable extent at the mercy of the company. Frequent agitations respecting the abuse of corporate powers by certain classes of public service companies have set the public thinking for themselves. The consumer wishes to know why his light flickers, why the quality of gas is not better! He wishes to read his own meter. He wishes to have the complaint clerk attend to his frozen service or clogged burner at once, or he may even try to adjust it himself. He demands cheaper gas, and if he doesn't get it he attempts to secure the passage of legislation giving such inquisitorial powers into the private affairs of the company as will give him an opportunity of proving that he is entitled to a cheaper rate and that the company is making an unreasonable profit by denying it to him. Obviously, the consumer is antagonistic, and in this attitude can easily be made an enemy, depending entirely upon the way in which the company responds to his demands. Granted, as I have already suggested, that the consumer is at times unreasonable, the company can, by tactful and sympathetic attention, convert him into his best advertisement. It can take him into its confidence, deal with him individually, instead of as a member of a distant class, and make him a part of its organization instead of a mere purchaser of its product. It can effect such a cordial and personal relation between itself and the consumer as that every complainant, however antagonistic, leaves the office a friend and not an enemy.

The consumer must be the company's friend. The company cannot exist without the consumer, but the consumer may, if he wishes, select any one of several mediums of light, heat and power, none, of course, as good as gas, but all open to the consumer who can afford to pay for them, and who, for whatever reason, prefers not to use gas. The consumer prefers to be decently handled, and will invariably deal where service is good. All complaints and applications for the installation of service, and every other request coming from the consumer, can be promptly and efficiently remedied. While this treatment of the consumer may be regarded as a duty owing to him, it is obviously the best kind of business.

Each consumer should be treated alike. We are all aware that, as a matter of law, there can be no discrimination between consumers, which legal obligation is but the observance of a plain moral duty in a legal relation. No one consumer is entitled to any greater degree of courtesy than any other consumer, They all stand upon the same basis. The consumer, moreover, thinks and acts for himself and is quick to discern any discrimination, being only too ready to assert that any preferred consumer "stands in." This is injurious to a company; its effects are far reaching. The large body of consumers grow to feel that there are a few who are always preferred. Gas companies have persisted in leveling their consumers to such an extent as to require their own employees, and frequently their own officers, to pay for gas in the same manner as the consumer who has no connection with the company. The days of free light or other preference of service extended to persons connected with the company are rapidly passing. Gas companies are universally appreciating the necessity of meeting all users of gas as consumers of the same kind, whether or not they are associated in any capacity with the company serving them.

The consumer comes in contact with the company in almost innumerable ways. The complaint clerk is constantly visited by him. The cashier is seen regularly every month, likewise the collector in a great many cases. The meter reader and the employee for the fulfilling of complaint orders are in constant contact with the consumer. So also is the solicitor for new business. In each one of these respective departments the consumer should be considered with the greatest attention. His business should be made the company's business, and his every desire should be so carefully attended as to make him feel that he is a part of the company's wide organization. If all antagonism toward the consumer is laid aside, and a course of conduct adopted which has for its slogan courteous and prompt and efficient attention, the net returns to the company, no matter under how great difficulties business is conducted, will greatly increase. Stockholders will be satisfied and directors will be satisfied. The office force will be happy and employees will be content.

There is one other matter to which I desire to refer. It has to do, not with the relation of the company with the consumer, but with the relation of the company to its employees. You probably know that there is at present pending in Harrisburg legislation of a most drastic character, looking toward the liability of a company for injuries to its employees from whatever cause such injury may arise, as well as employees' compensation during illness. We have felt in Reading the necessity of anticipating the consequences of injuries to employees, and we have accordingly established a series of rules respecting such injuries, which rules, so far as I have been able to learn, are original with this Company. In case of sickness of an employee, we pay the employee during such illness one-half of what he would receive were he working on regular time, provided that such illness continues longer than 3 days. During these 3 days he receives no pay. In case of an injury to an employee from a cause within the employee's control, the employee is treated in the same manner as if it were a case of ordinary sickness. In case of an injury to an employee from a cause not within the control of the em-

ployee, the employee is paid his full wages during the time of such illness; he is also paid his doctor's bills and such expenses as may be required for nursing. These payments are made regardless of the length of time of his illness. Cases of fatal injury must, of course, stand upon their own facts. We have also made a practice to pension employees, the pension being governed by the length of service and by the amount of pay. There have, of course, been few cases in which this has been necessary, but we propose adhering to the precedent which has been established. Each case must obviously stand upon its own facts.

In order to emphasize these rules to the employees of our Company, we called all of them together in a common meeting and instructed them fully as to the meaning of these rules. We believe that this innovation in courteous treatment to employees will have many far-reaching results in the harmonious relation between the Company and its employees. We have felt that there was too much occasion to become antagonistic and too little occasion to inspire the confidence of employees and to secure from them the best results which they were capable of giving.

In closing I feel that there might be a great many details in which the service of gas companies could be improved. By service in this connection I mean not merely service to the consumer, but to have the term cover the entire field of manufacture, distribution and new business. The broad assertion of Mr. Brandeis, respecting the economic management of railroads, while producing a great deal of derision, undoubtedly has considerable truth in it respecting all public service corporations. We all know that in the management of such corporations there is considerable waste which results from unscientific methods and from lack of knowledge of real conditions. It has been in my mind for some time to suggest the appointment of a committee for the purpose of investigating the economic management of gas companies and have this committee report at the next meeting of this Association.

Natural Gas and Earthquakes: A Correction.

[Prepared for the AMERICAN GAS LIGHT JOURNAL, by MR. FREDERIC EGNER.]

It was a privilege of the writer to attend the Eighteenth Annual Meeting of the Pacific Coast Gas Association, held at Los Angeles, Cal., September 20, 21 and 22, of last year, and to receive recently, through the courtesy of Mr. Henry Bostwick and the kindness of Messrs. John A. Britton and William Schade, officers of said Association, a copy of the bound "Proceedings" of the convention named. Looking over that very interesting volume, it was but natural the writer should examine the record of what *he* was reported as having said, and was "painfully amused" to find that his little speech had gotten badly mixed up with what he did say, and what the stenographer thought he said. We all know that mistakes are liable to happen if "Remarks" are not corrected by the authors, and for that very good reason opportunity is usually given a speaker to correct the copy submitted by the reporter or his typist. This was not done in the present instance, for the writer was obliged to leave for the East almost before the meeting was over, and as it is too late to correct the volume already issued—the subject being perhaps worth serious consideration—it is hoped the Editors of the JOURNAL will deem it worth while, in the interests of all concerned, that a corrected version may appear in the said JOURNAL. On page 395, Vol. 8 of the "Proceedings" of the Pacific Coast Gas Association, the remarks attributed to "Mr. Egner" will be found; and it is a fact that, while some portions are correctly quoted, they are so jumbled and out of place or sequence with the real article, that no one not present at the meeting could "Make head or tail" of them, by merely reading the book. Yet the subject—so it seems to the writer, and so it did to Mr. Schade, who called on him to speak at the time, after hearing in private conversation his views—that this correction should be made, if not in the same language, still in substance. Let the reader judge for himself, however.

The subject under discussion at the time was certain speeches made by Mr. Fitzsimmons, in the course of speaking on "The Oil Situation from a Gas Man's Viewpoint," by Mr. H. W. Burkhart; and permit me to interject here, that said paper is a most valuable one, full of interesting, pertinent information anent the oil question. Mr. Fitzsimmons stated that there was *then* one gas well in California, producing sufficient gas to supply the entire State. It was after that gentleman and others had spoken that the writer was asked to state his views as expressed to Mr. Schade a few days before, and here is the substance, if not the words, *verbatim et literatim*. In February, 1906, we had an account in the daily press of a huge natural gas well having been found in Kansas, which, having been set on fire by lightning, was belching forth flame and gas at the rate of many *millions* of cubic feet per hour. At the time the writer remarked to friends, "Look out for an earthquake now, sure." This was said because of certain observations made during a number of years, though mainly based upon a theory. Briefly, as to the theory. No doubt all of the readers of the JOURNAL know quite well what an air-lock is, as applied to tunnel building under water.

The air pressure keeps out the water, enabling work to be done which otherwise would be impossible. It is also generally believed true that the interior of the earth is in a high state of heat; or, as it were, living fire. Furthermore, that the earth contains vast stores of combustible material, and such as will be rendered so when subjected to great heat; as, for instance, limestone and carbon forming carbide, from which we in turn obtain acetylene. Water itself, as all know, is composed of a highly combustible gas, *and the supporter of combustion;* but a wise Providence so proportioned these they will not disintegrate, excepting under the action of intensive heat, when they would immediately recombine. though with destructive force, to form water; or, as we do in water gas making, when the vapor of water (steam) is conducted through incandescent fuel, which offers an easier combination to the oxygen of the water, to form carbonic oxide and acid, setting the hydrogen free without danger.

Thus we find that in the earth are all the elements to fit the theory which assumes that the great pressure frequently noticed in natural gas wells may easily be akin in action to our own known airlock; and that, when this pressure is removed *faster than it can be reformed* by natural causes, it is not a too far fetched theory perhaps to assume that ways will be made for some of the great reservoirs of water upon the earth to find their way to the internal fires, with almost unimaginable but fearful results. In the vast amount of combustible gas which rolled down from the mountain upon Martinique, which accounts for "fire" getting in "*even under closed stateroom doors* for a short but terrible few moments," *the gas was seeking oxygen*, and burned when it was found. If those who remember, or who will refresh their memory by reading up the stories of this awful disaster, they cannot account for that significant fact any other way. The writer will not take up further time and space by argument upon the latter subject. The writer's theory then, was and is, that, by withdrawing great quantities of natural gas—or in other words, releasing the airlock within the earth faster than natural forces can make up for the gas or force thus withdrawn—water will find portions of the intensely hot interior of the globe, and *some* earthquakes are the natural result.

Hence, when that natural gas well, more particularly described in the AMERICAN GAS LIGHT JOURNAL for January 7th, 1907, let go on February 23d, 1906, and for fully 5 weeks emitted, per calculation, more than 840,000,000 cubic feet of gas, the conditions for an earthquake were ripe enough, and seem to have finally manifested themselves in no uncertain form at San Francisco, Cal., April 18th, of the same year. This may happen at any time, of course. So, when it was proposed to pipe natural gas to St. Louis, Mo., knowing that good gas could be made at said city for less money than it could possibly be piped there, the writer mentioned the fact to some interested parties, along with his earthquake theory; and again did the same thing when Mr. Fitzsimmons spoke of supplying the whole State of California with natural gas, wishing merely to point out some possible dangers from said source, which would far outweigh the gain of dollars obtained by selling the product of the well. It might be worth while for Legislatures to look into this subject, and, while not prohibiting the use of natural gas as a whole, yet insist that at no time should the gas be drawn from any well whatever, below a certain, to-be-determined, pressure at the mouth of the gas well concerned. Finally, I beg leave to repeat something which I really did say, viz.: That many works could be easily so improved that good artificial gas could be made for less money than it would cost to pump the natural gas to the points wanted, not to mention the cost of plant required to do it. And that holds good for several places besides St. Louis, Mo., Baltimore, Md., or the Pacific State cities.

THE Cruse-Kemper Company has been awarded a contract for the construction of a 100,000 cubic foot capacity holder on the plant of the Dover (Del.) Gas Company.

[Official Report.—As Furnished by the Secretary.—Continued from Page 756.]

PROCEEDINGS, FORTY-FIRST ANNUAL MEETING, NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

First Day—Afternoon Session.

A DIP INTO THE QUESTION BOX.—*Continued.*

The President—We will pass on to this question:

"Is it good practice to correct gas made for pressure?"

Will any gentleman answer that question? [No response.]

The President—The next question is:

"How much more fuel per 1,000 feet of gas is required to operate a 9-foot than a 6-foot generator, in each case having 8-foot carburetters and superheaters?"

Dr. Wing, can you give the question any answer?

Dr. Wing—Mr. President—I am only familiar with the sets that have uniform diameter units. I could not give you any information.

The President—Perhaps Mr. Nute could tell us.

Mr. Nute—I certainly cannot. I have had no experience at all with 9-foot machines. I can tell you something about the coal required for an 8-foot 6-inch, but somebody else must tell us about the 9-foot.

The President—The next question is:

"Which is the most practical size, and is an 11-foot water gas set as efficient as an 8-foot 6-inch set?"

As to those two questions, seemingly anybody who will answer one will answer both. Apparently no one has an answer ready. The next is:

"Is it customary with gas companies to sleeve the supply pipe through cellar walls for protection to same?"

Is Mr. Gould in the room?

The Secretary—Mr. President, I think that matter was brought up some years ago, in my recollection, by a former engineer of the Cambridge Gas Light Company, and if I recollect correctly further, assuming it to be a good scheme, I had some blocks of wood cut out something like a split sleeve, with the intention of making a wooden sleeve around the service pipes where they pass through the foundation wall. I presume some of them were used; but, unfortunately for the benefit of the science, the records are faulty. It is my personal opinion that it would have a certain advantage in checking the tendency to create deposits of naphthaline and possibly frost at the point where the service goes through the foundation wall, on the supposition that the stone work of the wall coming in absolute contact with the iron of the pipe may conduct the heat away, so that there will be a sudden drop in temperature of the gas coming from the ground along the service pipe in the ground to that portion built solidly into the wall.

The President—Is there anybody in the room who makes a practice of sleeving a service pipe? Apparently it is not the universal custom.

"What is the demand for tar for road making?"

I can say that in Holyoke if I had had twice as much tar, both coal gas and water gas, I could not have any more than supplied the demand for use on the roads. We have been doing for the last two seasons quite a lot of missionary work. I worked on our Board of Public Works 3 years before I could get them to try it. The last two summers I have given them all they would use. Now they come to me for twice the amount that I can make for them. I think if anyone has had experience in using either or both the tars on the highways around his neighborhood he can testify that the experiments have been successful. I understand they have done more or less of this around New Haven. Mr. Beardsley, do you know anything about it?

Mr. Beardsley—Mr. Barnes, who has had charge of the most of that, is not here. He sold a good deal of water gas tar, previously dehydrated with steam. This was done, not so much to de-hydrate it as to take out the more volatile portions of the tar, so that the tar would not have so great an odor on the road. A great objection to it has been the odor. A great deal of it has been spread around New Haven and with very good results, though I can't give any details about the lasting of the road under that treatment. We have not put any coal tar on roads by spraying.

Mr. J. A. Gould—Mr. President, I understand you gave away this tar. I should think you might give away a good deal.

The President—Gave it away. As I say, I was doing missionary work. I have got them so now they cannot get along without it, they will have to pay for it.

Mr. C. A. Learned—A gentleman who is not in the room and possibly not a member of this Association, told me a short time since that he sold about 20 carloads of tar to the State of Rhode Island, A portion of that tar also went to New London. The lot sold to Rhode Island was used upon State roads. We think in Connecticut, as you do here in Massachusetts, that the demand for tar upon roads is increasing. It is with me, in a smaller way possibly than in New Haven, but still it is increasing, and we expect this year to sell a great deal more tar for road purposes than in former years. There was a time when we bought a good deal of your President's surplus tar, but to-day he has done something better with it. The results, at least in Rhode Island, are away ahead of anything I have heard in our locality.

Mr. Nute—We have been working on that a little bit for the last year or two. Last year we sold between 50,000 and 60,000 gallons of water gas tar for road use, with most satisfactory results. We got a contract with the State Highway Commission to treat about 1½ miles of road across the river from us, and I had a very much appreciated letter from the Secretary some time after the work had been done, saying that our work had been approved by the Board. We have convinced our superintendent of streets that water gas tar is the best material to be used on the surface of a macadam street, and he has in his recent annual report very strongly recommended to the Board of Aldermen that all the macadam street shall be tarred this year instead of being watered. We hope if the board supplies the money that we shall treat practically all the macadam streets in Fall River this year.

Mr. Barnes—I should like to ask the President (also Mr. Nute) what preparation, if any, is given to the water gas tar by either the President's Company, or by the Fall River Gas Company, or by the Street Commissioners, before it is put on the streets?

Mr. C. A. Learned—And, Mr. President, I would like to add to the question of Mr. Barnes: What is put upon the tar after it is put on the street? Has it a sand covering?

The President—Mr. Nute?

Mr. Nute—In our case the tar is not treated at all. We are situated a little differently from most works in that respect, and when we are ready to use our tar there is no water in it. An analysis has shown about ½ per cent.; practically no water in it. In regard to the other question, we started covering it with sand, but soon gave it up. We concluded the sand in the course of time would simply become dust and blow about the streets and was not of any value. We rope off the street (generally ½ day is sufficient) and then let the travel over it.

A Member—Do you heat your tar?

Mr. Nute—We don't do it intentionally. It is heated, however. The tar goes to a large separator and is fairly well separated there, the water being pretty well taken out; then it is pumped into the relief holder tank. The water here in normal working attains a temperature of about 130°. The result is, in the course of time the tar is very thoroughly separated and is pumped from the bottom of that relief holder tank and comes out practically free from water.

The President—With us at Holyoke the water gas tar has absolutely nothing done to it. They take it just as it comes from the well. For the use of the coal tar we have a tank that will hold four of their sprinkling cartfulls, and our practice is to have that tank full at night, leaving steam on the coils that are in the bottom of the tank over night, so that in the morning the tar is thoroughly heated and thinned out. When they draw it in their watering tank carts it remains hot until they get to where they want to put it on the street. In the use of both water gas and coal gas tar they use both sand and fine dust from crushed stone, for covering it. They don't rope off the streets at all. As soon as the tar is on they put on a thick enough covering of either dust or sand, so that an automobile or a team can go right over it, although if one thought a good deal of his team he had better not go over it for 24 hours.

The Secretary—I would like to ask about what quantities they put on per unit of surface?

Mr. Crafts—And I would like to ask if you use that on macadam roads or on roads of other types, such as dirt or gravel roads?

The President—We have a stretch of 4 or 5 miles of gravel road that is main highway between Springfield and Northampton, on which most of the coal tar has been used. They have used it on macadam roads too; but the results on that gravel road have been surprising. It forms a coating or crust over the surface that would easily fool anybody into thinking it was sheet asphalt. A part of

that road is a clayey soil, which usually in the spring is badly rutted and heaves some, but last spring there was absolutely no rutting and no heaving. As soon as the frost had gotten out of the top of the ground apparently that roadbed came right down smooth, with the same crust of tar on top that was there in the fall. It was surprising to see how it preserved that gravel road.

Mr. Stetson—I have made an effort to do a little missionary work, but the parties have not consented to allow me to extend it very far. Our treasurer tried it two years ago. Living on a street, not a main street but a residence street, he mixed some water gas tar and coal tar, putting it on without preparation or care as regards the method that should be pursued. There was some criticism of it among the people for a few days, but it soon resolved itself into the position that you speak of. A hard coat formed over the road. He has been requested to continue its use on the street, and I believe it has been done once since. The road, after the winter's wear, is, as you say, in excellent condition. I think in the neighboring towns of Mattapoiset and Marion, towns to the east of us, that have used somewhat the tar processes, the method is to take one-half of the street and apply the tar and let it have a little while to settle or to season, as you might say, then to turn that half into use and take the other half. Their roads are certainly a very great improvement on the roads in our city, where we are using oil. After the oil is applied, if the rain comes soon after, it is in the most objectionable condition; you track the oil and mud into the house and there is generally a row. So I was surprised at the success of our treasurer's effort when he took so little pains to follow the proper method of making the installation. From a macadam road—in answer to that question—the dust of the road should be swept away and saved if you want to put it on again after the stone crushing sand has been put on. The tar should be put on hot, and it should be put on on a hot day; that is, the hotter weather is a better time. If you are going to do it nicely the tar should be kept as you suggest and put on hot. Let it penetrate. I suppose all of us have read the way to do it, but the thing is to convert the authorities from oil. What the argument is that makes oil attractive over tar I cannot say; but this is the road out for our tar product, and it is one I think we all ought to use our best efforts to advance. I am willing to give our city tar enough to put down an experimental road, if they will take it as a gift and put it down as I want to have it done. I think, making that effort as you have, it only needs that amount of sacrifice to establish the fact that tar is the one thing to make a road of. I believe that is the road out for our product. Now it is a littlle bit of trouble to us; that is, we don't get as much money for it as we should.

Mr. Mansfield—A gentleman not a great way from here has quite a large number of miles of tar road, the tar being simply laid with the road. The road was sprinkled with coal tar, and gravel spread over it. I guess, indeed, all the rolling was done by the carriages after it was spread. The road is to a certain extent stringy; you might think it was almost covered with a coating of India rubber in places. They have been at it now, I think, for fully 7 years, and have used probably between 800 and 900 barrels of tar in the town during that time on the roads.

Mr. Carpenter—Mr. President, this tar road business is not entirely a new feature, because in our town our roads are practically made out of coal tar, and have been for a great many years. In fact, we have very little good road making material there, everything is practically all sand; but we have in our town over 40 miles of tar road, all made out of coal tar. While our Company makes water gas, and we do not have much tar to sell, there is a great amount of coal tar used on the streets at Oak Bluffs, and the road is very satisfactory. When the sun comes out hot in the summer it sort of heals it up and makes it new where the cracks have come in the winter, and getting around easily would be almost impossible there without these roads. The two adjoining towns of Edgartown and Vineyard Haven are beginning to take this thing up too. Edgartown made its first tar road appropriation this last year. and there the tar was put on an ordinary dirt road.

Mr. Willien—I might say, in regard to tar for road purposes, a meeting was held in New York last month of the different road engineers. Nearly every State this side of the Mississippi was represented there, and they discussed different methods and different materials used for building roads. At this year's meeting the opinions of the different engineers seemed to be more in favor of tar than ever before. Of course, a great deal of heavy asphaltic oil is used instead of tar, but they seem to be coming around to tar to use for road purposes, and it has given satisfactory results. I heard Prof. Blanchard, of Rhode Island, give a very interesting talk in Boston about 2 or 3 months ago on his trip to Europe. It seems that they use tar there for building roads and obtain very good results.

Mr. Nute—In answer to the question as to the quantity of water gas tar, I have found that, on a macadam street, we average on the first coat about $\frac{1}{16}$ of a gallon per square yard. The second coat, if put on the next season, will take about $\frac{1}{4}$, and the third coat about $\frac{5}{16}$ of a gallon per square yard. After the first coat is put on, even if the road goes for an entire year, the amount of tar absorbed the second time is only about $\frac{1}{4}$ gallon per yard.

The President—Mr. Hawken, do you care to say something on the subject?

Mr. Hawken—Mr. President, I would like to know whether or not crude coal tar will give as good results on a macadam road as the treated tar. Small plants cannot afford to treat their tar, but they can afford to sell it for $2 a barrel. I note that our State of Maine is paying $4 a barrel for treated tar, and they put it hot on a macadam road. It does not penetrate over $\frac{1}{4}$ of an inch into the macadam, and I note that this winter it is cracking very badly on top. I have treated about 100 feet of the State highway in front of our place. and note that the tar penetrated 3 inches. It does not show any bad results whatever. Next summer I hope to see the difference between the high priced tar and the crude tar.

Mr. C. A. Learned—Mr. President, simply answering Mr. Hawken's question, and just giving a personal opinion, my belief is that if the water is out of the tar it is equal to tarvia.

Mr. Hawken—I tried the crude tar 2 years ago on a piece of macadam road and it gave excellent results. It was a perfect binder, just as good as any other I ever saw.

The Secretary—Mr. President, I can talk freely on this because I don't know anything about it. Probably it is a fact that if you get crude tar in the right condition it is just as good as prepared tar, perhaps better. I imagine the benefit generally derived from prepared tar is that you get pretty nearly a uniform article. In some of the work that I have seen it seemed as if there were a variation in the quality of the material they placed on the road, so that in some places it would penetrate differently. In some places it would bunch up; that is, it would lie in pools, and then when they filled it up with some filler, why, as the road wore, there would be a bunch. In another place, where they did not get on quite so much, or perhaps did not get in quite so much filler, there would be a depression; as you rode over the road you would notice the irregularities.

Mr. Hawken—Is that not caused by the autos, from the pull that there is on the tire? On a hot day the light surface of tar on the top pulls like elastic and does not get back again.

The Secretary—I think not the bunches that I have in mind, because they are too large and too irregular for that.

Mr. Morrison—Mr. President, I think we ought to distinguish between road making and the use of tar for treating made roads. For road making there is no doubt that water gas tar is not the right thing, and that the heaviest tar we can get is the best; but for treating macadan roads that have been in use and worn down, water gas tar is the thing to use. I think we should be careful not to specify water gas tar for building roads.

Mr. Kennedy—Mr. Chairman, on a trial only to a limited extent in Cambridge of the water gas tar, containing, I think, $\frac{1}{2}$ or 1 per cent. of water, the Superintendent of Streets said to me he could in no way find any difference between that (for surface treatment) and the tarvia, "B."

Mr. Barnum—Mr. President, I would like to ask Mr. Kennedy how he gets the water down to 1 per cent. of the tar.

Mr. Kennedy—We happened to have on the plant three cylindrical tanks which were unfit for other use, and rigged those up on piers. We pump our tar from the tar separator into those tanks (through which we have the exhaust steam of the pump going) in series, and also in parallel, if the case requires it to be worked in that way. So that the tank filled to-day has the exhaust steam passed through it entirely, ordinarily, and the water is driven off. The tar, of course, is drawn from the bottom, and the remaining water is overflowed by gravity back into the bottom of the separator. By little extra use of a man who is already paid to do some work and doesn't do any too much—I am alluding to the pumps' engineer—we manage to get the tar down to about $\frac{1}{2}$ or 1 per cent. of water.

The President—Are there any other gentlemen who have anything to say on this subject? I think the gentleman who asked this question will feel that there is a demand for tar for road making, or a use for it on the road. The next question is:

"What is the effect on registration of a station meter due to the distortion of the water level inside the drum, with the meter running 30 per cent. overload but not breaking the seal?"

Major Hinman—My experiments show that a station meter does not depend so much on the load as it does on keeping the water line inside the drum at a constant level. If you do that your meter will register correctly, whether it is overloaded or underloaded. I have tested a 2-foot station meter at such a rate that the loss of pressure was 2 inches, but keeping the water inside the drum at a constant level, and found that it registered just as correctly as when the loss of pressure was only ¼ of an inch. If you have an arrangement so that you keep the water line inside the drum constant the meter will register correctly.

Mr. J. J. Humphreys—That is my question, and, of course, I wanted the Major to answer it; but what I wanted to find out was whether the screw motion of the drum drove the water from one end to the other and in that way affected the registration fast or slow.

The President - Mr. Gould, would you care to answer this question?

"What would be considered the only sure test in laying new gas mains to detect leaks?"

Mr. Gould—Do you mean to find whether the main you have just laid is leaking?

The President - I take it to be so.

Mr. Gould We always put a test meter on every main we lay. The main valve is closed, the test meter is connected to test pipes on each side of valve and all leakage in main must pass through meter. The index of meter shows a registration 60 times what the true index registers, or as much in one minute as actually passes in an hour. No main is turned on till that main is tight.

The Secretary—Mr. President, Mr. Gould has taken the question out of my mouth. I was just about to ask him what his minimum was before he turns it on?

Mr. Gould—We have refused to turn on a main where we found $\frac{1}{10}$ of a foot an hour.

Mr. J. J. Humphreys I will add that, like a good many others, we pump up to 8 pounds and watch the gauge, and, irrespective of the registration of the gauge, soap the face of every hub, where one very often finds sand holes. Under that pressure soap suds on the joints make practically a surety of it.

Mr. C. A. Learned - Mr. Chairman, this brings up a very interesting question. Too long a discussion, however, would have to be gone into to tell you the whole story of a past experience. I will simply say that, in laying what might be termed a high pressure line to an adjoining town 2 years ago, I found, by putting on 20 pounds of air, some disastrous results; that is, there was a seepage of air through the body of the main. Part of these joints were made with lead, and part with an insulating compound and Dresser couplings. After this rather severe experience of 2 years ago, in laying into another town this last year we decided it was advisable to have all of the gas main tested at the foundry, not only with the hydrostatic pressure of 300 pounds, which all of you are familiar with, but tested to 50 pounds of air. When this matter was brought to the attention of the foundry people—I think I submitted it to five different concerns—four of them turned me down absolutely. The fifth, however, who were enterprising people, said, "We have the apparatus to test with air, but we have never done it before. There is no reason why it may not be done; but why do you ask for so severe a test?" I explained that I had had an unpleasant experience the previous year, and as I was laying mains for 100 years' time I thought my Company could afford to pay a little extra for having the main air tested. I thought it was necessary to have an inspector at the foundry; as a matter of fact, I had two inspectors, one at the 6-inch mill where the main was tested to 300 pounds water pressure, and another at a 3-inch mill where the main was tested with 50 pounds of air. The company rigged up a very satisfactory machine to test with air. After the pipes were tested at the 6-inch mill they were run down on a railroad to the old mill, which I have termed the 3-inch mill, and were again tested with air. You know that when main is tested with water the shock is not great if a pipe breaks, but it becomes an entirely different matter if you are testing a main with a good many pounds of air. Devices have to be provided for preventing accidents. So at this mill devices were provided for preventing accidents, and 10 pounds of air were put upon the pipe. Then it was soaped from end-to-end, soap suds was put on from end-to-end with large whitewash brushes, which can be done in about 15 seconds; then, a stout iron cage dropped down over the pipe and 50 pounds of air was put on. Strange to say more than 5 per cent. of the pipe that went to the second mill showed defects, some of them quite large defects. That pipe was condemned; but the pipe that was sent to us for laying we considered was as near perfect as any pipe could be. We paid a small amount extra for this air test. We laid the pipe with all Dresser couplings and compound joints, because we paralleled a trolley every foot of the way. It happened that, at the beginning of this main we found a farmer, for we were going through farming country, who had a silo machine and a gasoline engine, Into his little building we put a small Gould air pump and belted up to the gasoline engine, and after our sections of main were made we pumped up to 20 pounds of air, simply to see that our joints were laid carefully. We were very sure about the pipe that had been satisfactorily tested at the foundry. So that the results of these tests, while they sound extreme, make me feel very well satisfied with the class of work that I did for my Company last year into the suburban town, and I feel that that money was well spent, for the reason I have given. You and I are laying mains for 100 years to come, and if you are laying mains that have not been tested carefully then a leakage commences at the instant and it will go through 24 hours of 365 days of every year, and we are coming to the time of being pretty careful on unaccounted-for gas. There are other details to which I might refer, but time will not permit. I would be glad to explain to any of the members present later about them.

The President—Is there anything further to be said upon this question of tight gas mains?

Mr. Buckminster - Mr. President, I believe Mr. Humphreys said that after he laid his main he put 8 pounds of air pressure on and then watched the gauge. I wondered if he allowed anything for changes in temperature. I never found that the gauge would stay at any one point; it might go up ¼ inch, for that matter, after you filled it in the morning, as the temperature increased in the daytime.

Mr. J. J. Humphreys—We depend very little on the gauge, simply using it to catch quickly anything very big. The soap suds are what we count on. We leave the pressure on until we are through and note any falls. Sometimes there is a gain. If it happened to be in the morning the pressure may run up, and in the afternoon it usually runs down.

The President—Next we have this query:

"What would be considered good results in a 3½ foot Lowe generator gas set, with Lehigh coal and Texas gas oil?"

Can some of our members in smaller works answer this question?

Mr. McKnight—Mr. President, allow me to correct that. It is a Lowe-Granger gas set.

The President—There does not seem to be any gentleman able to answer that question. We have one topic for discussion, and after this is finished we will consider this part of our day's work done. It is the matter of "District Governors, High and Low Pressure Distribution." Mr. Gould, will you lead off in discussing that topic?

Mr. J. A. Gould—Mr. President, I did not expect to lead off on this question, for I understood I was to make some supplementary remarks to the main discussion. If I have to do it I will do it, but this was simply an annex to the main paper, I understood, not the paper itself.

The President—If you will start it off, seeing that you are on your feet.

Mr. Gould—The Boston Consolidated Gas Company employed district governors to good advantage late last fall in reinforcing the pressure in the distributing mains in two districts where conditions had temporarily caused a drop in the gas pressure. In the northerly portion of the Jamaica Plain district this condition was caused by the removal of a 10-inch main to allow the building of a sewer, and this pipe must remain out of commission till next summer. The supply was taken from the 24-inch supply main, which is a part of the main laid by the old Massachusetts Pipe Line Gas Company. These mains deliver all the gas made by this Company, both for its own consumers and for the several independent gas companies The gas is pumped into these supply mains at the Everett works at a pressure of over 20 inches, and is delivered directly to the several distributing holders. At Jamaica Plain a 6-inch Lloyd controller was set in a connection between the 24-inch pipe line and the Jamaica Plain distributing mains The pressure in the local mains dropped as low as 1.6 inch before the governor was operated, while now a nearly uniform pressure of practically 3 inches is maintained at all hours. I have brought a few pressure charts, taken from gauge in office about half mile from controller, which show how perfectly the pressure is maintained. The operation of the controller is so simple that the chart

taken the first night is as perfect as these shown. The second controller was installed in Brookline. At this place a small distributing holder became disabled, so a 6-inch controller was set in the valve house, through which the gas passes from the 36-inch supply main into the distribution. The holder has been dismantled and will probably not be used again. Last August we ordered 700 lengths of 20-inch main to reinforce the supply in this district. The temporary arrangement is now working so well that we are almost sorry we ordered the pipe. We would have obtained better results here if we had installed a controller of larger size, as we find there is a drop of about 5-tenth inch at 6 P.M. The outlet of the controller is connected to a 10-inch main, which sends gas in two directions, so it has considerable to do to keep up its part of the business. The valve house is close to our local office, so the valves are opened only from lighting up time to 11:30 P.M., and an hour or two in the morning. This method of reinforcing the distributing system has worked so successfully in these two cases that it has opened up future possibilities, as there are 10 miles of these supply mains passing through our distributing districts, and it is a relief to think that in 4 weeks' time we can reinforce a district that suddenly shows signs of weaknsss when the winter load comes on. Of course, there are limits to which this method can be safely carried. To obtain the full value from a supply main there should be distributing holders of ample size into which it can deliver gas at a uniform rate during the whole 24 hours. A distributing main must deliver practically ⅓ of the total daily output in the 1 hour of maximum demand. Under these conditions a distributing main must deliver gas 3 times as fast as a supply main, and we must allow for this fact when we try to make the supply main supersede the holders and large distributing mains. Unfortunately, our supply mains were not designed to carry high pressure.

The President—Mr. Learned, have you had any experience with these district governors?

Mr. C. A. Learned—I have not. In our high pressure district there are individual governors on each service only, no distributing governors.

The President—Has any other gentleman had any experience with these?

Mr. Sucher—Mr. President, in New Haven we are now using two Reynolds district regulators, and I can say they are working very well indeed.

The President—Will Mr. Lloyd give us some points on district governors?

Mr. Lloyd—Mr. Chairman, I don't know, from the title of that topic, whether it is specific work that is contemplated or whether it is the general proposition of distributing the peak hour loads under pressure. From what has been said it would seem as if the question of pressure distribution was more involved than the specific means for accomplishing it. There is no question that we are all coming to the distribution of gas under very considerably higher pressures than have been heretofore contemplated. Those pressures in the supply mains will run up to 5 or 8, possibly 10 pounds, and they will be cut from those pressures to the distribution pressure for the district, whatever it may be. In arriving at the mouth there will be a number of methods—in fact, a number of methods are being employed at the present time. There is one of the earlier methods in which the gas is raised under pressure at the works, and that is distributed all through the city under that higher pressure. District gauges are employed for the purpose of determining the low district, and individual house governors are used for reducing the pressure at the houses where the pressure in the districts is too high for local use. The most notable example of that is in Grand Rapids, Mich., where I believe, if I speak from memory correctly, they have something like either 13,000 or 17,000—I won't say which—of these house governors in use, and they raise the pressure at the present time, I think, to about 28 inches at the works on the peak load. That system has aroused a good deal of controversy as to its advantages. You will see that it is necessary to raise the initial pressure to such point as will deliver the required quantity in the most restricted main or district that you may have in the city, and that may involve carrying excessive pressures in some districts, which will result in increased leakage, of course, besides absorbing power for the necessary compression. I know of but the one instance where that is universally employed, and even there they are beginning to consider what will be the economical limit of that initial raise of pressure. You will see that that is nothing more than an amplification of the ordinary method of distribution, raising it at 1 pound. The more general system is to either lay trunk mains from the works on which pressure is put, and then cut that down with district regulators into the districts, or else to use a main which is too large—rather unnecessarily large—for distributing work, cut it out of the low pressure system, convert it over to the higher pressure, and then reduce from that. That will save in many instances the necessity of laying a trunk line. That is being done in connection with the use of street trunk mains from the works. One of the large installations of that character is in Detroit, where they have a number of miles of the higher pressure mains and they run up to somewhere in the neighborhood of 5 or 6 pounds at the works. That carries out 7 or 8 miles, in a measure it belts the city, and from that they distribute into the larger of the old trunk mains which connect with the very small mains. You will find that it is not generally advisable to reduce from a high main into a small district main, because the pressure dissipates in too short a length, the friction of the pipe is too great; so that it is better to reduce into a header and from that feed the lateral. As Mr. Gould remarked, in feeding through a 6-inch regulator into two 10's, the size of the regulator will be determined by the differential of pressure; that is, the drop that you can afford through it. If that drop is very slight, if it may only be 2 or 3 inches or so, you must necessarily have a larger opening through the regulator than if the differential is very great. Five pounds on the inlet will enable the use of a very small regulator. I might say, for instance, that suppose you were feeding a 12-inch line and had 10 pounds on the inlet it is conceivable that the regulator, with a couple of inches of opening, with 10 pounds of differential, would supply as much as a 12-inch main could carry away at 3 inches. On the other hand, if the supply main was down to 6 inches and you wanted to supply 3 inches, then you must have a very much larger regulator. The decision as to the size of the regulator itself is one of the important things in satisfactory operation, because if the pressure on the inlet is varying greatly, and it is likely to be low at the point of the peak, it is then necessary to have a large opening, whereas if that pressure is maintained on the inlet when the peak goes off, and the regulator comes very nearly shut, you will naturally see that it is harder to keep the pressure from creeping on the outlet when there is so much larger regulator than is necessary to hold shut. So that each installation requires a good deal of individual thought; but you can accept it, I think, empirically, that the increase of gas that you are going to have from now on is going to be sent out through increased initial pressures and reductions. I don't believe that you will lay very much more street main for feeding purposes, that is, exclusive of new districts, of course, until you have probably trebled your present outputs.

Mr. Stetson—Mr. President, in our district the factory growth is at the extreme north and south ends of the city; the center has not felt the growth to the same extent. At the north the extreme growth is perhaps 1½ miles from our works. We were unable to feed that section satisfactorily with the pipes that were originally laid. Although we made an effort to get a larger feeder there it failed to give enough gas, so we laid for this 1½ miles an 8-inch pipe, putting a district governor at the end and also quite near the center. After that had been accomplished the south end of the town grew so that we had difficulty in maintaining the pressure there, which provoked criticism, and we laid last year to the south somewhat over a mile of 8-inch pressure main. At both ends of the town we have stepped in a local governor house, which is in the ground, of course, and now we have to follow the customers in our variation of the pressure at both ends of the town when these mains are being drawn on to their limit, or at least at the peak of the load. We have to run for the factory people, to get their breakfast and dinner and supper, a special pressure, and start our pressure lines. In that way we have accomplished very well the purposes for which the pressure mains were laid, and I don't know any other way it could have been accomplished in the same time without great expense in enormously increased mains, how it could have been accomplished at all. It seems as though that had done good work in this way. It has furnished the supply, and the criticism has stopped. In connection with the first gentleman who spoke, I should like to know what district governor he has used. We are going into a neighboring town that will take some 10 miles of pipes, and I should like to know the success of the individual governors that were located in the houses, whether there has been any trouble from the escape of gas and whether they are generally satisfactory. After the gentleman sat down the question I had in my mind was the distance he carried the pressure and the kind of district governor he was using, and whether in the individual governor he had a successful, proper and safe tool. The fact is in our

district—and I presume in all the districts, but very particularly in our factory district—there is a great deal of carelessness in regard to the care of the gas in the houses. A great many of the people are using gas for the first time, and they are experimenting on blowing it out, which usually leads to a job for the undertaker. We have had enough of that kind of trouble, if it can be avoided in any way.

Mr. Gould—The controller we use is the Lloyd.

Mr. Stetson—Yes, I know of that.

Mr. Gould—We have had no experience with high pressure house governors. This supply is taken off about 9 miles from our mains. It starts as two 42 inch mains and reduces to two 36, and finally a 36 with a branch 24-inch main to this Jamaica Plain district, about 9 miles from Everett. The initial pressure is about 22 inches.

Mr. Stetson—Thank you.

Mr. Gould—The little knob you see on the charts is not owing to the governor. That is the impulse given to light some of these impulse lights about 4 miles away from this place, and shows slightly in Jamaica Plain, as the mains are all connected together.

Mr. Stetson—I wish I could get the regularity that you show on your line.

The President—There not being anything further seemingly to be said on this topic, we stand adjourned until 10 o'clock to-morrow morning.

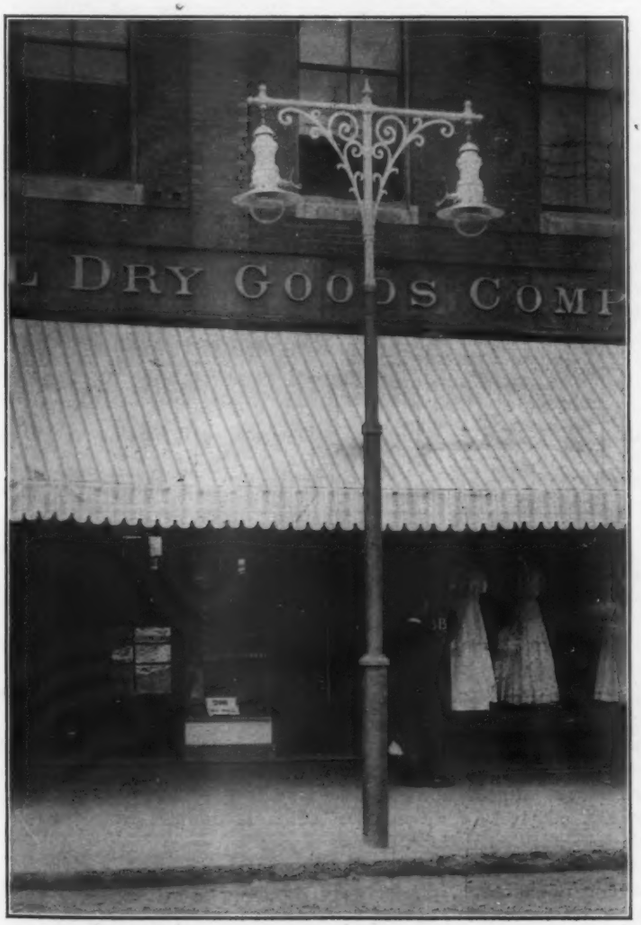
SECOND DAY, MORNING SESSION.

The Association reassembled at 10:20 A.M. The President introduced Mr. H. H. Kelley, of Waltham, Mass., who read the following paper on

GAS ARC STREET LIGHTING.

We have in Waltham, I believe, the first installation of a gas "White-Way" made in Massachusetts, and while it is not as extensive as we hoped for or expect, yet it is very satisfactory to the merchants.

In May, 1910, I designed the wrought iron post shown in the blue print, and, by consent of the Manager of the Company, ordered three posts. We erected one on a private way leading to the works, and asked the Mayor and Superintendent of Streets to look at it and give us their opinion. They decided, as we had, that, while it was not as ornamental as some types of cast iron posts, and might not be suitable for a public park or in a residential section, it was a good post for a business street.



We selected the shopping section of a business street, about 1,450 feet in length, and planned to place the posts about 50 feet apart on both sides of the street. Early in the canvass we found that, as is common in most small cities, the bulk of trade is on one side of the street, we were obliged to confine our efforts to that side entirely.

We began to talk "White-Way" to the merchants in earnest. Very few favored it at first; some were non-committal; some wanted to wait until the dull summer season was over; some wanted to wait until their neighbors had decided. The most unsatisfactory ones were the stores owned by out-of-town parties and operated by a local manager. We were able to interest but one firm to the extent that they gave us permission to erect two posts in front of their store for the purpose of demonstration. These were installed in June, one opposite each entrance of the store and 50 feet apart. The Mayor granted us a special permit to erect them with the understanding that, if they were acceptable, we would apply to the Aldermen for permanent locations.

In August we began a vigorous canvass and found that a front-foot price would not be accepted. We decided upon a price of $6 per post per month on a yearly contract, to be lighted every week-day night, from dark to 11 P.M., basing the price upon the gas consumption and estimated material maintenance, we to furnish gas, light and extinguish, clean and keep in repair. We secured contracts for 10 posts; from one firm 3, from another 2, from two 1 each; two pay ½ each, and three pay ⅝ each.

By the installation of these posts the firm that has 3 removed 6 outside electric arcs, another discontinued the electric light in his sign, and at a branch pay station of the Company we have a post that we maintain (not included in the 10 mentioned) that lights in good shape a sign previously lighted by electricity.

The post, as I have stated, is made of wrought iron pipe as follows: Seven feet of 6-inch pipe, with a 10-inch cast iron flange at the bottom for a bearing, a 6 by 4-inch coupling, 5 feet of 4-inch pipe, a 4 by 3-inch coupling, 3 feet of 3 inch pipe, a 3 by 2-inch coupling, and 4 feet of 2-inch pipe. The arms are 1¼-inch pipe, with a spread of 4 feet 10 inches. Railing crosses with ball ornaments are used at the center and each end. The scrolls are cast iron and held at the top by bands around the 1¼-inch pipe; at the bottom, by a clamp band at the top of the collar. The lamps are 5-light, inverted, white and gold; height of mantles above sidewalk, about 14 feet. All above the 3-inch are painted with aluminum; 3-inch and below are painted black.

A long thread is cut on one end of the 2-inch and made into the 3 by 2 coupling, extending through sufficient to take a 2 by ¼-inch coupling for the 1¼-inch riser. The yellow lines on blue print show the riser and its entrance to the post through a hole in the side 5 inches from the bottom. Connection to service is made with a long screw. When the post is finished in the shop it is tested to 8 pounds pressure. The cost complete, including the lamps ready to install, is $48. Average cost of maintenance this winter for material only has been 38 cents per month per post.

A wire guard is used on the globe. I have one here that is arranged so that the globe may be removed without taking off the guard or lowering the globe ring and shade.

It simply opens and hooks together. It closes over the globe so that in removing the latter just unhook those two hooks. It is held at the top in the regular way.

Discussion.

The President—Gentlemen, you have heard a paper interesting through opening up a fairly new line in our business. Has anyone present had any experience along these lines? Will anybody question Mr. Kelley?

The Secretary—Mr. President, I would say that I have not had any experience, but we have put out quite a number of these lamps on building fronts, more especially in the Chelsea division, and we are now getting quite a number of orders for them in the East Boston division of the Company. I think in Chelsea they have something over 100, and it is regarded there as good business. Of course, they are in that case on the consumer's meter, so the Company has no responsibility for lighting and extinguishing, as in this case; further, we don't get them to burn a stated number of hours as they do in Waltham, which, of course, is very desirable. I would like to hear an expression of opinion as to the results of experience, and also the judgment of members as to the policy of putting out these lamps on

a rental basis. My personal preference is to sell appliances whenever possible; but, of course, we must have the business, and if we cannot sell the appliances it is frequently better to put them out and get them to burning gas even if we have to stand the capital charge. I really would like to get some further information on the subject for my own interest as well as for the interest of the meeting.

The President—Mr. Norris, has the U. G. I. Company experimented any along this line?

Mr. Norris—Not to any great extent, and certainly not exactly on the lines described in the paper.

The Secretary—I was under the impression that in Philadelphia they lighted up whole streets with them. From some statements I had seen in the journals I got the impression that Philadelphia was ablaze with gas arc lights; that every property owner had one in front of his place of business.

Mr. Norris—There are lots of gas arc lights there, but I do not know under what terms and conditions they are erected.

Mr. Farrow—I would like to say that we have done some outdoor lighting at Tufts College, and have some private lights such as Mr. Kelley has at Waltham. They have given very good results. I might say that these lights attracted the attention of one of the officers of the College, he is a member of the Board of Aldermen of the city of Somerville, and he sent a request to the office that we furnish him data on these lights for street lighting. How far it will go I do not know. On the other hand, we have several installations—in fact, several dozen installations of these lights outside of buildings. We sell all the lights outright. The consumer pays for all glassware, and we maintain the mantles. The cost of maintenance is very low. I have no exact figures on same, but it is nothing extravagant.

The Secretary—One other thing in this connection I would like to have brought out, as well for my own information as for general interest, is what progress has been made in distance ignition—perhaps that will cover it more particularly for lamps or installations of this nature. It seems if we either sell or rent an arc lamp to a customer, to put out either on a post or on a bracket in front of his building, it will be necessary to make it quite convenient for him in order to get him to use it as much as we want. Of course, we know there is the electric valve, the pneumatic valve—the pneumatic valve was referred to somewhat yesterday—which met with more or less success. It seems to me we are looking for something that will meet with more success. In one or two instances I have arranged for what might be called a positive arrangement for turning on and off the arc light. The latest scheme which I have put out has been to place a spring on the stem of the valve, which would normally hold the valve closed, then by means of a cord attached to the end of the yoke passing up over a pulley through the wall of the building, so that the user could pull the string and light the lamp, and when he got through, release the cord and allow the spring to shut off the gas. Of course, that is fairly positive in its action; it is not dependent on electricity or the delicate working of a pneumatic valve. I have not had a sufficient number of them out to demonstrate what difficulties may be encountered with that sort of thing. I do, however, believe that in anything of this kind simplicity is one of the fundamental requirements.

Mr. Farrow—Speaking along the lines of distance lighting, while this is not exactly an outdoor experiment it may be an interesting one. We have recently installed in the chemical house at Cambridge an arc lamp, which we have connected to the fire alarm, so that when the fire alarm comes in from the central station the first stroke of the gong turns the light on. Later on we may have something interesting to say about this. It is a new thing in gas lighting, I think.

Mr. Morrison—I should like to ask Mr. Kelley to give us the cost of gas figured per year, and maintenance, with interest on his investment.

Mr. Buckminster—In Lowell we have half a dozen installations that consist of a cast iron post, made in two sections, with a cement joint, the 2-inch riser pipe extending probably 4 feet above the top section; I don't know just what the total height is. At the top of riser is a horizontal arm, and each end is connected by a half-circle piece overhead. Two lights are suspended from each end of the horizontal piece, similar to the post that Mr. Kelley described. These have an inverted arc light on them, and I believe in all cases they have been put out on a rental basis of $2 a year, on the old style, and $4 a year on the new style. We maintain them, put on the mantles and clean them once a month or once in 3 weeks. These have a separate pilot-line run from the cellar out to the post, and can be either worked automatically with a clock, or they can be handled with gas cocks. The pipe is run from the meter, upstairs, where it would be handy for the people in the store to work it, then down to cellar and out to the post.

The Secretary—I would like to ask Mr. Buckminster if he has a separate pilot-line run out.

Mr. Buckminster—Yes; a separate pilot-line.

Mr. Morrison—I would like to ask Mr. Buckminster if that gas is metered; if not, what he gets for it?

Mr. Buckminster—Yes; it goes through the regular meter.

The President—Mr. Kelley, do you care to answer any questions?

Mr. Kelley—The cost is figured on the cost of the post. I cannot tell you the quantity of gas we figured, not having the figures handy; but it runs an average of 5.2 hours per night. Material maintenance costs so far this winter have been much less than we calculated upon.

On motion of Mr. Coffin, seconded by Mr. C. A. Learned, a vote of thanks was extended to Mr. Kelley for his paper.

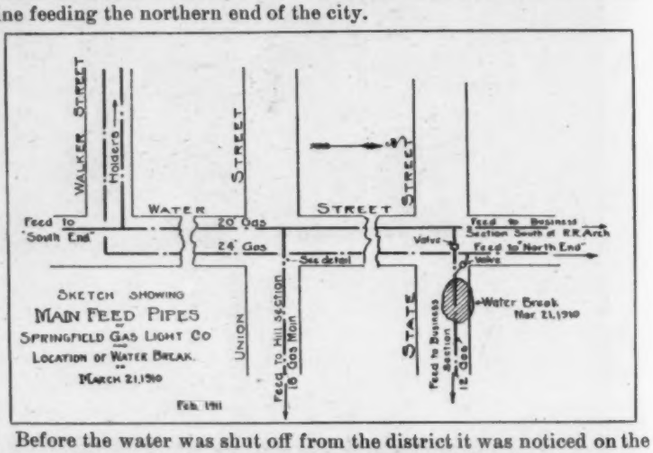
The President—The next paper will be that on

EFFECTS ON DISTRIBUTION SYSTEM AT SPRINGFIELD OF BREAK IN WATER MAIN,

by Mr. B. P. Bill, of Springfield, Mass.

Many of us here present, and possibly all of us, have from time to time experienced unusual conditions in the operation of our different plants. Some of these may come with a forewarning, but others come at the most unexpected time. In March, of last year, the writer passed through one of these unexpected occurrences, which to him afterwards was rather interesting; but at the time it was very trying. The writer will try to make plain to those present what a little time it takes to make a great deal of trouble and how long it takes to remedy the same.

On March 21, 1910, about 9 A.M., while writer was at his office, one of his clerks called attention to the fact that there was a water break in front of the office, the volume of water shown at that time being about the size of an ordinary water bucket. Immediately the Superintendent of the Water Department was called to the 'phone and notified of the location of the break, but before the men of the department arrived to shut off the system in this locality, the volume of water appearing had developed into a column about 6 or 8 feet high with a diameter of about 20 feet, flooding the cellars of our buildings and others in the vicinity to a depth of 4 or 5 feet. This break was located near a 12-inch line, feeding from a 20-inch line, running through the business section of the city. Parallel to this 20-inch line was a 24-inch line feeding the northern end of the city.



Before the water was shut off from the district it was noticed on the pressure gauges that our pressure was dropping fast, thus indicating that we had lost this 12-inch line due to the break, and it was quite evident that our system was being flooded. Between the point of break and 20-inch line mentioned there was a valve, but, owing to the volume of water, it was impossible to shut this valve for some time. Immediately upon noticing that there was a drop in pressure, our high pressure booster system was started up (this system being used only on peak load demand), and we were thus able to keep the pressure at a point about 1 inch until such times as we were able to change our service from the 20-inch line over on to the 24-inch line. The lowest point noticed in the drop of pressure was to 1 inch, and this only lasted for a period of about 15 minutes from the time the drop was first noticed.

Immediately after re-establishing normal pressure on rest of system not affected, means were taken to relieve the district flooded, which consisted of about ¼ square mile in area, covering the most im-

portant part of the business section of the city, in which were located about 5,000 meters. Some 15 pairs of men were immediately sent out with drip pumps to the drips in the district affected, and also one large steam pump at one of our yards, which is connected on to drips in that locality, was started up. Gangs from the jobbing department were also sent out with instructions to go to all large blocks with services of 2½ inches or larger, to open up same direct into the sewerage system and allow water from main to drain into the same. The volume of water that we were thus obliged to handle may be judged by the fact that the normal pressure on the water system is 135 pounds and dropped to 40 pounds immediately.

The cause of this trouble later was found to be due to a 24 by 8-inch reducer blowing out of the 36 by 24-inch tee. (A peculiar fact in connection with this reducer is that, owing to the character of the ground, the Water Department was never able to find this reducer, the same burying itself in the fine sand, and, after hunting several days and driving bars down to locate the same, hunt for it was abandoned.) The work done to relieve this section affected did not begin to show much before 9 o'clock at night when we were able to relieve some of the consumers located on higher grounds. During the time a number of hotels, restaurants and manufacturing establishments were put to a great deal of inconvenience through lack of service. The work of draining this system showed no material effects until the following noon, when we were able to supply gas again to about ⅔ of the district previously affected. During this time, precautions were taken that no accidents should happen. This was done by sending out another set of men who made a house-to-house canvass, and in all places where there was any chance for an accident to occur the meters were shut off. After resuming service this same gang went over the ground again and examined all places where they had shut off the gas previously, and, if same were found to be in safe condition, the services were turned on again. Service on the whole system previously affected was resumed at 6 o'clock on Tuesday night, although we were obliged to pump for several days afterwards before we entirely relieved our mains from the water.

Break in Water Main, Springfield Mass., March 21, 1910.

After service was resumed, steps were immediately taken to ascertain in what condition the mains were, particularly in the immediate vicinity of the break. Upon examination of same, it was found that the 12-inch line and the 20-inch line feeding same were both found to contain from 6 inches to 8 inches of sand in each for a distance of about 1,000 or 1,500 feet. In the removal of this sand entered still another task, but this was accomplished by cutting out sections of about 4 feet at every 100 feet, and scraping and washing same out with high pressure water. With the exception of repairing where the 12-inch main was broken, both ends having been previously plugged, our system was back in normal condition on Saturday of the same week.

Later, July 27, another break occurred in this water system, which was not as serious, although it caused us considerable anxiety, as we had one 12-inch and 24-inch low pressure and two 4-inch high pressure mains which were very close to where this break occurred. Fortunately, we only lost the high pressure lines. The cause of this break was a defective 36 by 24-inch reducer, which split.

One of the most gratifying facts in connection with these cases is

Break in Water Main, Springfield, Mass. March 21, 1910.

Break in Water Main, Springfield, Mass., July 27, 1910.

the fact that, as soon as the public found out what the trouble was, we ceased to have any complaint, and in connection also with same, would say that we had no claim or suit brought against us in connection with these accidents.

Discussion.

The President—Gentlemen, you have heard a recital of experience that we probably are all congratulating ourselves that we have not had. There may be those who have been mixed up in just such a combination and complication, or there may have been a complication akin. We should be glad to hear from anybody who has had any similar experiences.

The Secretary—As usual, I may say I don't know anything about this, for I never happened to have it, but it seems it is something that is liable to happen most any time. In fact an accident of the kind happened in New Bedford 2 years ago, which I don't know was reported to this Association. The condition there was a little different. A 4-inch water-hydrant branch crossed a 6 inch gas main, and owing to the beneficent effects of electricity connection was made between the two, about a 1-inch pipe capacity. The result was a 1-inch water supply was connected to a 6-inch gas main, and you can imagine what happened. It was rather misleading, because there was very little indication at the point of trouble, as the connection was almost complete between the two pipes so there was no washout of the ground, merely a little water was finally noticed seeping up around the hydrant, so that they were in the dark for quite a while, both as to their gas light and as to what the trouble was. I think it flooded something like 2,000 meters. One of the first indications of the trouble was that a gentleman went into a drug store to buy a cigar, got it, and went to one of these tilting lighters to light it. Instead of gas coming out a stream of dirty water hit him in the eye. Naturally then an investigation was started.

Mr. J. B. Dolan—I would like to ask if the pipe was cracked all around?

Mr. Bill—It blew the reducer right out of the fitting. I would say

that the gas pipe is about 6 feet deep at that point, the water pipes are about 5 feet below that, just to one side, and it is a soft, sandy ground. That fact I mentioned. We lost the reducer. We spent considerable time and money trying to find it, for the simple reason that it was a special fitting and they could not get a duplicate at once. I should say they dug down about 18 feet below the surface and then sounded with bars, but were not able to locate it.

Mr. Dolan—I have had three similar cases in my district, where water mains had broken, and where our gas mains laid close to the water pipes. One break was in a 36 inch metropolitan water line, where a piece, about 6 feet long and 1 foot 8 inches wide, was blown out of the side of the pipe. Another was in a 24 inch main where a piece, about 2 feet 6 inches long and 1 foot wide, was blown out in same manner as the above. And the third was where the same 24-inch line was cracked all around the pipe. In any of these cases, had any of our gas mains been broken at that time, it would have flooded our system and shut off our whole district. And we would have experienced the same unpleasantness as the Springfield Gas Company had, pumping our drips, etc.

Mr. Bill—On that second break I would say there was a 24 by 36 reducer. It blew out about two-thirds of the bottom. Whether originally it was a defective casting or not I don't know; but when they put in the water system—I suppose for economy—every gate they put in was reduced from 36 to 24. That either was an undue strain on the reducer, else it was defective in the first place. The amount of water they lost and the damage they did to other people were a good deal greater than in the first break that I mentioned.

Mr. Nute—I had an experience a few years ago which, while it was not so serious as Mr. Bill's case, was very interesting. The city was laying a sewer about 30 feet deep, blasting through solid ledge practically all the way from the surface, and was doing it in the winter time. The sewer ran right between the water main on one side of the street and our 8-inch gas main on the other side. There came a thaw and a rather heavy rain during the night, and the 20-inch water main gave way, settled, and broke. The flood of water was thrown across the street against our gas main, the dirt underneath was washed out, and 2 lengths of 8-inch pipe dropped into the sewer 20 or 30 feet below. We were notified about 11 o'clock at night there was trouble in that district. We got out men and tools and succeeded in digging down and bagging it off in 2 hours' time. We had our main cut off almost as soon as the water department had got the valves shut off.

Mr. Buckminster—I have a faint recollection of an experience we had a few years ago. An old type water heater was set in a residence on a rather high elevation and a gasket gave way, allowing the water to pass through the heater, through the meter supply and to the lower district, cutting off a few consumers. It does not have a direct bearing on this case.

Mr. Kennedy—We had a rather interesting Christmas eve two years ago in Cambridge, though it did not result disastrously for us. At Harvard Square the metropolitan 48-inch water pipe suddenly broke and cleared out the whole section there, flooding it for about two hours possibly. Our 12-inch line ran parallel to and only about 3 feet from the water pipe. The only thing that saved our pipe was an angle formed in this 12-inch line; and the water was playing on the curved side of that bend, which was backed up by sand that was being forced behind it. It appeared to be the only thing that kept the pipe whole. If the water had gone against the concave side of the bend it would have torn the whole thing apart. We felt very much relieved by that, but men stood on the gates all night ready to shut off.

The President—Gentlemen, our time is somewhat limited. I think that we had better close this discussion and pass on to the next paper.

On motion of Mr. C. A. Learned (seconded by Mr. Dolan) a vote of thanks was passed to Mr. Bill for his paper.

(To be Continued.)

A QUEER commentary is this. The site of the old plant, formerly located at the corner of Lady and Lincoln streets, Columbia, S. C., was sold by the Columbia Gas Light Company to Messrs. Meighan for $30,000. In 2 weeks time all vestiges of the gas works were obliterated and the new owners thereupon disposed of it to Mr. John E. Lowrey for $40,000. He cut it up into building lots, and in less time than 60 days sold the plots at auction for a total of $58,750. He also reserved for his own benefit and use, a lot having a dimension of 50 by 100. Talk about the impoverished South!

The Fuller and Warren Composite Cooker.

That house well-known to fame amongst the stove makers as the Fuller and Warren Company, informs us that it is about putting on the market a combination coal or gas cooking range that presents more than one worthy feature.

To the Company's well known "Ideal Stewart" coal range a bracket is attached at one end, the bracket being pierced with three holes for the proper supplying of gas therefrom. The top of bracket runs flush with top of range, forming a convenient shelf when not in cooking commission. Directly above the range top are located the elevated gas oven and broiler. The right hand section is given over to the oven, which measures 18 inches in length by 15 inches in depth and 10 inches in height. This sort of combination virtually makes two ranges in one, either of which can be put in service, independently or together, according to the wish or choice of the cook. The attachment, is of course, substantially made, with due regard to durability also; in fact, no other stove on the market is better made. One-quarter turn, adjustable gas cocks are employed, and the Graves patented lighting device for the oven burners has been adopted; all the burners can be quickly and easily removed without the trouble of unfastening bolts. Another desirable feature is that the oven and broiler are connected by means of a 3-inch pipe to the flue vent. There are other minor features connected with the apparatus which go towards making it worth while. Mr. Chester I. Warren informs us that the Company has submitted the apparatus to the severest sort of tests practically in respect of its cooking, baking and broiling powers, each of which it responded to most satisfactorily.

Special English Correspondence.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, ENGLAND, April 10, 1911.

The Proper Depth for Gas Main Pipes.—Sulphate of Ammonia.—Coke.

Some attention has been directed to the subject of the depth below the surface at which gas mains should be laid, by reason of an endeavor on the part of a county road authority to establish control over this matter, and to enforce a minimum depth of 30 inches clear. The introduction of 15 or 20 ton road rollers, which is now general, has been attended with some disaster in the way of fracture of mains and drawing of service pipes. This has been more noticeable in small towns and country districts than in large busy areas, because in the latter case the subsoil is already consolidated by continued heavy traffic, probably of an equal wheel base weight to that represented by the steam roller. But in roads that have never known any heavier traffic than a 2-ton coal wagon, the 20-ton roller is a surprise, especially as it usually happens that the crust or road metal is none too thick. I have frequently seen such rollers in country roads, driving a decided ridge before them, and it is no uncommon thing for the surface of the road to be bodily lowered to the extent of some inches. In addition, the fashions have changed in regard to the shape given to the top surface as shown in elevation. Formerly the rule was to have the road nearly flat, with no more incline from the center to the sides than was necessary to run off the rain water, or to have it incline to one side only, so that one gutter should drain the whole of the road. But the modern idea is to camber the surface to something like the segment of a circle with a chord of 4 or 6 inches at the center.

The conversion from the old to the new form is usually effected by the simple process of adding new metal at the crown of the road only, and trusting to the weight of the roller to drive down the sides as above described. In country districts a very common error is to use stone that is too soft, too brittle, or too variable in quality to be fit

for the extra strain caused by the roller, although it might have suited the old conditions. If the stone is soft or brittle, a large proportion is simply crushed, and if it is variable the soft parts are crushed by the hand. The heavy road roller, to be a success, must be used with a suitable metal, tough enough to consolidate throughout, and that without crushing, and so shaped as to prevent the soft subsoil from spewing to the surface. The metal should form a solid crust distinct from the subsoil, not driven into and not incorporated with it.

The road engineers have one answer to all complaints as to damage to gas mains, and that is, lay them deeper. Their excuse, when the above facts are brought before them, is that the pipes are too shallow, and they refuse to consider the matter in any other light. Cast iron gas mains are not crushed, but simply fractured, usually transversely, and wrought iron service pipes are not flattened, but drawn away at the junction with the main. If the subsoil is forced down 2 or 3 inches, something must go, seeing that neither cast nor wrought iron is sufficiently elastic to stand permanent elongation. But the idea of the average road engineer seems to be that another 6 inches of depth is the cure for all trouble.

While engineers of gas works, for their own benefit, are willing to lay mains at a safe depth, and also required to provide a fall for the service branches towards the main, considerable hardship would be caused by a hard and fast minimum depth clause. The minimum, it must not be forgotten, is a very different thing from the average depth, especially on level roads, because the main must be laid with the necessary fall to the nearest drip box. Some experiments that have recently been made go to show that ordinary sections of main and service pipes, if solidly supported, are not crushed or flattened by the heaviest rollers in use, and that the real factor to be considered is not so much the depth, as the nature of the bottom support. The pipe is not supposed to be a girder, supported at intervals, but to sit solidly on the ground from end to end. If anything happens to cause the soil to draw away below the pipe—it may be the bearing down of the whole subsoil as above instanced, excavations for drainage or other purposes carried down to some depth below the gas pipe, or subsidence such as is common in mining districts—then long reaches of the pipe may be left unsupported, and it has to carry the load above it as represented by the depth at which it is laid. A fall ing away of only an inch is as bad as a yard, so far as the support of the pipe is concerned. These considerations also illustrate the importance of seeing that the whole length of the pipe is properly and solidly bedded when laid in the first place. This is a point that does not always receive attention, especially if the pipe is put down by contract. The levelling of the bottom is of a very rough and ready character. Evidently it should be carefully set out with proper recesses for the sockets, so that the whole bottom area of the pipe may lay solidly, and in rocky or stony soils a layer of sand or loose earth may be used with advantage. A hard soil that has to be blasted, or broken out with wedges and pickaxes, cannot be very accurately levelled. The same as regards service pipes. One often finds the service men using no special precaution to secure a solid end-to-end seat for the pipe.

Sulphide of ammonia is in good demand this spring, and the result should be a good season's work for manufacturers of apparatus, because many engineers have been led, by the prices now quoted, to consider in the first place whether the apparatus in use is efficient in extracting the whole of the ammonia from the gas, and in the secord, whether the sulphate plant is efficient in extracting all the ammonia from the liquor. If the gas at the inlet of the dry purifiers still contains appreciable quantities of ammonia, or if the so-called spent from the sulphate still has not parted with the whole of its valuable burden, the returns from the item of sulphate will not be so large as they might and ought to be. And these points are accentuated when we hear of our neighbors pocketing a larger profit for sulphate than we are able to acquire. Many are asking these questions to-day, and the result cannot fail to take the form of additions and enlargements to the washing or the scrubbing plant or to the scrapping of the old sulphate set and its replacement by one of a newer and more efficient type. While the selling price of sulphate fluctuates the manufacturing costs are practically uniform, and, therefore, a rise in price is all profit. Lately the prices have been so low that some indifference in the matter has obtained, but as things are at present, it behooves the managers of gas works to take a few tests of the ammonia in the gas at the outlet of the last scrubber or washer, and also to examine a fair average sample of the spent liquor from the sulphur still.

There is also an excellent demand for gas coke this spring, and many companies are profiting largely by it. Some are so situated, owing to the ill-advised competition of large neighbors, that they cannot get the full advantage, because directly they lift the selling price above a certain rate, their market is swamped by dealers who hold large stocks purchased at a take-it-away price. In districts that are practically the dumping ground for the surplus from large works it is a poor lookout for the local product, and the only remedy for this state of things is to do away with the middleman and so get full control of the trade. The various district commercial sections are doing excellent work, but the full advantage of such will never be achieved so long as large parcels of coke are sold to dealers, with the restriction that it is not to be sold within 10 or 20 miles of the works where it is made, which in effect means, "Don't interfere with our trade, but never mind about anyone else." This question of surplus coke is one that might well be dealt with by a commercial section, and if people are so situated that they cannot sell the whole of their product, would do well to consult the local commercial section, instead of following the usual plan of advertising for public tenders. The members would know where coke is required, quite as well as a merchant, and could probably make better terms, without permanent injury to the local trade, that must eventually find its way back to the originator. It is now almost the universal custom to break coke to a convenient size for household purposes and to deliver it in the district at the customers's residence, in any quantity from a ¼ cwt. upwards. Some of the metropolitan companies supplying districts largely composed of flats find there is a good demand for ¼ cwt. lots, put up in tough paper bags. People in the country, however, will not pay the additional price necessary to cover cost of paper and package, which must necessarily be about 1 penny per bag—80 bags, the time and labor of weighing up 80 parcels and loss by the turn of the scale on so many weighings, make a substantial charge per ton of coke. In the country a man provides his own donkey cart, or perhaps a pony, and takes out cartloads composed of ¼ cwt. or 1 cwt. lots, and establishes a regular round and connection. Usually the gas company makes an allowance or commission on the quantity sold, and the whole transaction is for cash. The man pays for each load as he takes it out, and his terms are invariably c.o.d. An industrious man can earn a respectable income, perhaps 8s. to 10s. a day. There are usually one or more of these street hawkers, according to the size of the works. This meets the needs of the day laboring classes, and to suit the demands of larger customers who require 1 to 2 tons at a time, arrangements are made for prompt delivery of orders sent to the office. Attention to this department always results in the establishment of a permanent connection. Amongst this class of customers may be mentioned bakers, who invariably prefer a smokeless fuel like coke if they can get it, and many of the leading makers of bakers' ovens make a specialty of an apparatus specially adapted to use coke. In my experience I have invariably found that the people who use the gas will, by the adoption of methods as above indicated, also consume the whole of the residual coke. But I can quite understand that in colliery districts, where cheap coal is plentiful, some difficulty will arise in keeping the coke yards clear. As a general rule, however, there is a good local trade to be done with coke, and it is wiser to sell it in the district at a fair price than to keep the nominal yard price at a figure that practically cripples the home consumption, and to trust to dumping the surplus as a means of keeping the stock down. In some cases a good local connection is spoiled for the sake of a small temporary advantage. When the demand is brisk and stocks are low the price is raised to a limit, that has the effect of drawing custom in other directions, such as the use of anthracite or other coal. It is much easier to drive away trade in this way than to capture it again, and, therefore, some judgment is required in the matter of alterations in price. A firm, steady price, which need not of necessity be a specially low one, is in itself a recommendation, as people like to know what things are going to cost.

Recent Patent Issues.

Prepared for the AMERICAN GAS LIGHT JOURNAL by ROYAL E. BURNHAM, solicitor of patents and counselor in patent causes, 833 Bond Building, Washington, D. C., from whom illustrations and specifications of any patent mentioned below may be obtained for 10 cents.

989,092. Gas Lamp. G. Wedderburn, Vienna, Va.

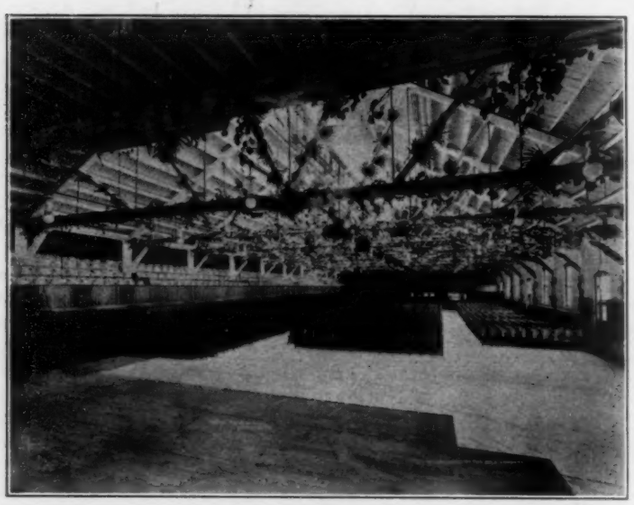
989,166. Apparatus for Treating Incandescent Mantles. J. T. Lister, Cleveland, O., assignor to the Cleveland Gas Mantle and Supply Company.

989,188. Thermostatic Cut-Off Device for Gas Burners. J. W. Peplinski, Erie, Pa.

989,324. Art of Producing Gases in pright Retorts. C. Bolz, Budapest, Austria-Hungary.

Lighting of Scranton (Pa.) Town Hall.

It is almost too well known to need further comment that the Hyde Park Gas Company has more than held its own in lighting many of the prominent buildings in that thriving city by means of gas arc lamps, the latest one being the new Town Hall, which is illustrated herewith. In this installation 30 Humphrey 5 light inverteds are



Scranton, Pa., Town Hall.

used. The lamps are finished in white and gold enamel and equipped with alabaster globes, and the installation has been pronounced a success in every way.

PUBLIC LIGHTING TABLE FOR MAY, 1911.

[Communicated by The American Meter Company.]

Day of Week.	MOONLIGHT SCHEDULE.		
	Date.	Light.	Extinguish.
Monday	1	7.20 P.M.	4.00 A.M.
Tuesday	2	7.20	4.00
Wednesday	3	11.50	4.00
Thursday	4	12.30 A.M.	4.00
Friday	5	1.00 F.Q.	4.00
Saturday	6	1.30	4.00
Sunday	7	2.00	3.50
Monday	8	2.20	3.50
Tuesday	9	2.40	3.50
Wednesday	10	3.00	3.50
Thursday	11	No L.	No L.
Friday	12	No L. F.M.	No L.
Saturday	13	No L.	No L.
Sunday	14	7.40 P.M.	9.50 P.M.
Monday	15	7.40	10.50
Tuesday	16	7.40	11.40
Wednesday	17	7.40	12.30 A.M.
Thursday	18	7.40	1.10
Friday	19	7.40	1.40
Saturday	20	7.40 L.Q.	2.10
Sunday	21	7.40	2.40
Monday	22	7.40	3.00
Tuesday	23	7.40	3.30
Wednesday	24	7.40	3.40
Thursday	25	7.40	3.40
Friday	26	7.40	3.40
Saturday	27	7.40 N.M.	3.40
Sunday	28	7.50	3.40
Monday	29	7.50	3.40
Tuesday	30	7.50	3.40
Wednesday	31	7.50	3.40

Items of Interest
FROM VARIOUS LOCALITIES.

"L. M. M.," writing from Wilkes-Barre, Pa., under date of the 14th inst., forwards the following: "The Wilkes-Barre Gas and Electric Company is preparing to spend a large sum of money before the close of the present year. Plans and specifications are being made with a view of erecting a storehouse and office building at the steam heating plant on Washington street. It is the intention to tear down the old office building and put up a fireproof brick structure, 3 stories high and basement, 42 feet in width and about 80 feet in length, equipped with all the modern conveniences, including elevator. The basement will be used as a pipe fitting shop. On the first floor, facing Washington street, will be the offices of the general superintendent and storekeeper and their assistants, with glass partitions dividing the different departments. Back of the offices will be located a storeroom for the smaller supplies, with glass partitions between the storekeeper's office and the main storeroom, so that the storekeeper can at all times see what is going on in the storeroom. Facing Washington street on the third floor, will be a club room for the employees of the Company, which will be 42 feet in length and approximately 25 feet in width, a partition dividing the room so that one part may be used for the general meetings of the employees and the other part as recreation room for the boys. After the proposed new building is completed, which is expected will be done by August 1st, it is the intention of the Company to move all of the machinery from the sub-station that is now located on Washington street to the steam heating plant, and offer for sale the sub-station property. Last fall the Company built an addition adjoining the boiler room of the Washington street steam plant for the purpose of installing additional electric equipment. During the winter, there were put in two 750-horse power Ridgway engines direct connected to general electric generators, with switchboard equipment; in fact, everything complete to make an ideal electric station. Contract has been let to Mr. P. J. Rimmer, of this city, who is a representative of the Ridgway Dynamo and Engine Company, for one more 750-horse power engine, an exact duplicate of those now in use, to be connected to a general electric generator of the same capacity as those put in last fall. A contract has just been let to Mr. R. Vaughn, for the erection of a coal conveyor at the River street power house, so that coal may be unloaded direct from the wagon and carried by the conveyor in front of the boilers. In addition to the conveyor line, there will be a new storage coal shed built with a capacity of 1,000 tons of coal. Approximately 2½ miles of gas mains will be laid on streets that have not herotofore had an opportunity to get gas. It is also the intention of the Company to extend its service wires on any street in the city where there is a demand for service which will warrant the Company in making such extensions. There is not much new work contemplated at the gas plant itself, for the reason that during the past winter new machinery was installed, making the gas plant in this city as near up-to-date as it is possible to get it. The estimate that has been made by Manager Wakeman for the extensions and improvements outlined above will cost the Company between $225,000 and $250,000. It is the intention of the present owners to keep its equipment and property in first-class operating condition at all times, and in order to do this, in some cases, it has meant the duplication of machinery, so that in case of breaking down of one piece of apparatus they would have another machine ready for instant use. It is not the intention of the Company to change the location of its present offices and showroom from the Y. M. C. A. Building when the new building on Washington street is completed."

Mr. F. L. Brown, who has just secured a franchise under which to construct and operate a gas plant in the twin settlements of Moss Point and Pascagoula, Miss., has associated with him Dr. Hans Bergman and Mr. J. C. Hamill. All are residents of Chicago.

The Morris Iron Company, of 91 West street, city, reports having received recently a number of orders for export covering its well-known types of outdoor fixtures. The latest order was from Limon, Costa Rica, for 100 cast iron arc posts.

We never received a letter that gave us more pleasure in proving that we were wrong, than one just to hand from Mr. Charles M. Cohn, the clever and capable Vice-President of the Consolidated Gas, Electric Light and Power Company, of Baltimore. The subject matter concerned our announcement last week respecting the installing there by his Company of a gas range factory. Mr. Cohn's letter states the case so nicely that we are sure he will forgive us for making these extracts from it. "* * * I thoroughly agree with your views regarding the advisability of one sticking to his own last, and that is what we are doing here. The article that appeared in the *Sun*, to the effect that this Company was constructing a gas range factory was misleading. * * * What the Company did was to lease some unused buildings to 'The Baltimore Gas Appliance and Manufacturing Company.' The buildings are being converted into the uses of the Appliance Company. I trust that your criticisms will

not be detrimental to the Appliance Company, which is a Company recently organized by Mr. W. H. Hunter." And we certainly trust so, too.

BROTHER CLARK, of Chicago, like most similarly named gas men, certainly has his nerve about him—and long may he continue to have it—for, despite the thousands of gas stoves heretofore put in service in the big city, and the really great City of the West, Mr. Clark and his brigade of commercial men have publicly announced that they expect to sell 40,000 "Composite Ranges" this season.

THAT Chief Harder and Lieutenant Dugan are up and doing was plainly told by us some time ago; in fact, that their plannings for the brightening up of Huntingdon, Pa., are real rather than fanciful is ably confirmed by this from a correspondent, forwarded from Huntingdon the 14th inst.: "Another addition to building operations which will be pursued during the coming summer has just been determined upon by the Penn Central Light and Power Company. In order to produce a better quality of gas and also to supply the increased demand for gas for both lighting and fuel purposes, the Company will erect, on the site of the old plant, a new building equipped with the most modern machinery. A storage tank will be erected on the site of the old Snyder coal wharf in the rear of the present plant. The old buildings at Second and Allegheny streets will be entirely rebuilt, in concrete construction. The plant and equipment will cost about $50,000. The gas section of the Company in Huntingdon is under the management of Frank P. Dugan, who is also Manager of the Lewistown branch of the same Company. Six years ago he was sent to Lewistown, since which time he has practically remodelled the gas plant there and greatly increased the service both in volume and efficiency. On being sent to Huntingdon in 1910, he at once began to devise means for improving the service, cleaning up complaints and giving complete satisfaction. Regarding expense attendant upon improvements Mr. Dugan has accomplished what he planned. Now it has been determined by the Company upon the recommendation of Mr. Dugan to put in this city a new, up-to-date plant. It is expected that work on this building will start in about 30 days. His first estimate of the cost was about $35,000, but the President of the Company said that that was not enough, and that if they put up the new building at Huntingdon they would erect the best that could be put up, the equipment to be of like order. The result of the plannings will be to give Huntingdon one of the finest equipped plants in the State."

THE executive head of the merger corporation which hereafter will operate the gas and electric lighting plants in Auburn, Geneva, Seneca Falls and Waterloo, N. Y., is Mr. E. F. Palmer, of Geneva.

THE H. Mueller Mfg. Co., of Decatur, Ills., has published a leaflet, the title of which is "Quality or Price: Which?" While to the intelligent workman or discerning corporation this pamphlet will not particularly appeal, in that that determining requires no questioning, it nevertheless can be read with interest by everyone, since the application of its truths is universal. But to the many whose judgment in selecting tools is in the main guided by price considerations, its tersely told truths should result in more than money information. Its contents are largely the important sections of a paper on the query which was read and discussed at a goodly assemblage of purchasing agents. In appearance the leaflet is like everything that comes out of the Mueller Company's printing shops, the pink of neatness.

THE Gas Machinery Company, of Cleveland, O., and the Gas Bench Construction Company, of St. Louis, Mo., have consolidated, and will hereafter be known under the titling "The Gas Machinery Company," the main offices and headquarters, of course, being located in Cleveland. Mr. L. C. Hamlink has been elected Vice-President of the Company, and he will have charge of the furnace department, with headquarters in the main office in Cleveland. An office will also be maintained in St. Louis, and this will be in charge of Mr. August Court, of the Gas Bench Construction Company. A high grade of silica and clay materials will be dealt in. May the consolidated venture have the best of good luck.

MR. NELSON G. PHELPS, formerly of the Peoria (Ills.) Gas and Electric Company, has actively assumed the duties of New Business Manager of the new Hoopeston (Ills.) Gas and Electric Company. Mr. Bryson, of course, continues as General Manager.

JOSEPH ZENDER, Chairman of the Committee on Gas, Dayton (O.) Council, is sponsor for an ordinance which proposes to fix the artificial gas rate in that city at 85 cents—the current rate—per 1,000, the agreement to run for 10 years from November 1, 1911.

AT the annual meeting of the Freeport (Ills.) Gas Light and Coke Company the following officers were elected: Directors, C. D. Knowlton, Wm. O. Wright, D. C. L. Mease, T. K. Best, Wm. Hall, Addison Bidwell and B. K. Farwell; President, C. D. Knowlton; Vice-President, C. D. Hall; Treasurer, W. O. Wright; Secretary and Manager, F. C. Weber. Plans have been made for the extension of the Company's mains to and through East Freeport and the Arcade addition.

GENERAL MANAGER F. A. LEACH, JR., of the Oakland (Cal.) Gas Light and Heat Company, reports that the Company will expend this year, in enlargements and reconstruction, a sum not wide of $750,000. The main development will be in its electric section, and the outfit there includes a mammoth electric turbo-generator, up to developing 15,000 kilowatts. The General Electric people are under contract to construct this magnificent piece of apparatus, the cost of which will be $500,000. On the gas division main extensions are projected, the estimated cost of which is $84,000.

AN interesting bit of news comes to us by way of Newcastle, Ind., to the effect that Messrs. C. W. Hooven, of Anderson; J. P. Goodrich, of Winchester; H. C. Starr, of Richmond; and Bacon, Olds & Co., of Indianapolis (all Indiana cities), who now own all the gas mains of the defunct natural gas concern, known as the Richmond Gas Company, from the Chesterfield, New Lisbon and Cadiz fields to Richmond, have brought suit for damages, impounding 3 defendants (Sylvester Thomas, Geo. Hewitt and Geo. Wimmer), each in $1,500 damages, for refusal to permit the removing of natural gas mains running through their farms.

GENERAL MANAGER GEO. B. TRIPP, of the Colorado Springs (Col.) Light, Heat and Power Company, has been authorized by his Company to put in gas mains in certain streets, well in advance of the repaving of the same by the city authorities. That looks like good business.

MISS GERTRUDE TEAL has been retained by the proprietors of the Mauch Chunk (Pa.) Gas Company, to demonstrate in that city, for a period of 3 weeks, the virtues of the gas range and the value of gas fuel. Not only will Miss Teal lecture, but she will personally visit all users of gas ranges in "the Chunks" in the period. It is also provided that special arrangements for her services may be made by communicating with the Secretary of the Company.

THE employees of the Scranton (Pa.) Gas and Water Company have formed a permanent organization, the intent of which is to bring about intimate relationship between the various departments and co-operative help in the performance of their various duties. The meeting was largely attended, and if the future performance of the body is indicative of the good that the organization will accomplish, it surely must be a worthy brotherhood. The officers elected were: President, J. M. Powell; Vice-President, Burton Carling; Secretary, Chas. Rodriguez; Treasurer, Alex. Thompson—the latter is also Chairman of the Publication Committee. So far these interesting papers have been given to the Society, namely: "The Gas Engine," by E. T. Ford; "Decorative Lights," by Chas. Rodriguez; "Store Lighting," by Burton Carling. Both President Scranton and Manager Stack are in direct sympathy with the objects of the Society.

THE Saranac Lake (N. Y.) Gas Company has applied to the Public Service Commission for the right to issue additional mortgage bonds to yield $26,274.27, a portion of which sum is to pay for extending its main system to Saranac Village.

THE Tuberculosis Hospital is located in Lick Run, a far suburban adjunct of Cincinnati, at least a mile away from any line of the Union Gas and Electric Company. Between it and the said pipe not a house is on the line of the road upon which it fronts. The people of the hospital wanted gas, but were too poor to pay for the necessary pipe line, but President Kenan and his associates speedily solved the difficulty. Not only did they agree to run the line, but also to install the necessary cooking apparatus. Tell us, please, what band of howling reformers ever did the least tithe of such for any of the Queen City's needy and suffering? Not a one! If a scribe could only write down what he would like! Phew!

MR. A. C. EINSTEIN, President of the St. Louis County Gas Company, has been elected President of the Columbian Club, of St. Louis.

AT the annual meeting of the Choctaw (Okla.) Gas Light, Heat and Power Company, the officers elected were: President, W. G. Reimer; Vice-President, H. W. Allen; Treasurer, R. L. Rinaman; Secretary, W. W. Newberry—a pretty progressive "bunch."

THE AMERICAN GAS LIGHT JOURNAL

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England—Aug. Siegle, 30 Lime street, London.

MONDAY, APRIL 24, 1911.

The Market for Gas Securities.

The market for Consolidated was in keeping with the general market, first it was up, then down; altogether it was unsatisfactory, both to bull and bear. However, the undertone was really good, and for the first time in a month or more. The opening to-day (Friday) was reported at 142½ to 143. The statistical position of the Company improves every minute.

Brooklyn Union is unaccountably weak, for there is all reason for constant increase in its value, seemingly through the steadily growing volume of its business. Peoples, of Chicago, is seemingly out of touch with the Harrison election at the time, and it is not at all unreasonable to assert that confiscatory legislation in Chicago over gas rates is unlikely. Lacledes are steady, and Massachusetts Gas Companies keeps right along in the ascending scale.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

APRIL 24.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$78,177,000	100	142¾	143
Central Union Gas Co.—				
1st 5's, due 1972, J. & J.	8,000,000	1,000	103	105
Equitable Gas Light Co.—				
Con. 5's, due 1962, M. & S.	1,000,000	1,000	115	118
Mutual Gas Co.	3,500,000	100	155	165
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	100	101½
New York & Richmond Gas				
Co. (Staten Island)	1,500,000	100	35	50
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	—	98½	100½
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	103	105
Con. 5's, due 1945, J. & J.	1,500,000	—	95	100
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	94	100
Standard	5,000,000	100	50	70
Preferred	5,000,000	100	70	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	103	105
The Brooklyn Union	15,000,000	1,000	138½	141
1st Con. 5's, due 1948, M. & N.	15,000,000	—	106¾	107
Yonkers	299,650	500	130	—
Out-of-Town Companies.				
Bay State	50,000,000	50	¼	5-16
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	—
" 1st Mtg. 5's	509,000	1,000	95	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	59	60
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed				
Gold Bonds	7,000,000	1,000	104	105¼
Cincinnati Gas and Electric				
Co.	29,500,000	100	92	93
Columbus (O.) Gas Co., 1st				
Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt. &				
Heating Co.	1,682,750	100	90¼	91
Preferred	3,026,500	100	75½	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	106½	—
Mortgages, 6's	3,000,000	—	89	100
Chesapeake, 1st 6's	1,000,000	—	—	—
Equitable, 1st 6's	910,000	—	—	—
Consolidated, 1st 5's	1,490,000	—	—	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	—
Con. Mtg. 5's	976,000	1,000	92	95
Bonds	75,000	—	—	100
Denver Gas and Electric	3,500,000	—	102	105
Detroit City Gas Co.	6,580,000	—	—	50
" Prior Lien 5's	5,619,000	1,000	97	100½
Detroit Gas Co., 5's	331,000	1,000	75	80
Equitable Gas & Fuel Co.,				
Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	39	40
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co.,				
1st Mtg. 5's	1,350,000	1,000	100	101
Hartford	750,000	25	190	200
Hudson County Gas Co., of				
New Jersey	10,500,000	—	112	113½
" Bonds, 5's	10,500,000	—	108	108¾
Indianapolis	2,000,000	—	78	83
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co.,				
of Missouri	5,000,000	100	—	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede Gas Co., St. Louis	10,000,000	100	102¼	102½
Preferred	2,500,005	100	94¾	102
Bonds	10,000,000	1,000	102½	103
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas and Electric Co.				
" 1st Mtg. 6's	400,000	1,000	106	108¾
Massachusetts Gas Companies, of Boston	25,000,000	100	91¼	91¾
Preferred	25,000,000	100	95	96¼
Montreal Gas Co., Canada	2,000,000	100	215	218¾
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	56	58
Bonds, 6's	6,000,000	—	137	138
New Haven Gas Co.	2,000,000	25	200	—
Peoples Gas Lt. & Coke Co.,				
Chicago	25,000,000	100	104⅝	104¾
1st Mortgage	20,100,000	1,000	—	—
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104¾	105½
San Francisco Gas Co., Cal.	15,500,000	—	—	—
St. Joseph Gas Co.—				
1st Mtg. 5's	1,000,000	1,000	100	102
St. Paul Gas Light Co.	2,500,000	100	—	—
1st Mortgages, 6's	650,000	1,000	104	108
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	3,447,000	1,000	97	98
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	101	103
Washington (D. C.) Gas Co.	1,600,000	200	410	412½
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	361	—

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New advertising, or changes in standing ads., to assure attention the issue following their reception, must be in hand on Wednesday.

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FINANCIAL NOTICES.

ANNUAL MEETING.

OFFICE OF THE UNITED GAS IMPROVEMENT CO.,
N. W. CORNER BROAD AND ARCH STS.,
PHILADELPHIA, PA., April 13, 1911.

The Annual Meeting of the Stockholders of The United Gas Improvement Company will be held at the office of the Company, Northwest Corner of BROAD AND ARCH STREETS, PHILADELPHIA, on Monday, May 1, 1911, at 12 o'clock, noon, when an election will be held for a President and six (6) Directors to serve for the ensuing year, and such other business transacted as may be brought before the meeting. The stock transfer books will be closed from 3 P.M., Wednesday, April 19, until 10 A.M., Tuesday, May 2d.

1871-2 W. F. DOUTHIRT, Secretary.

POSITIONS WANTED.

SARAH E. WOODWORTH CRAIG,

Lecturer and Demonstrator for Gas Companies. A few open dates.

Address, 2,316 Auburn Ave., Flat 4, Cincinnati, O.
1872-1

A gas and electric engineer desires a position as engineer or manager. Good record and references.

Address, "M. E.,"
1872-2 Care this Journal.

Energetic and capable young gas engineer of good standing desires position with reputable concern makidg gas apparatus or appliances, either as salesman or in construction department. Best of references furnished, and can be at liberty on 30 days' notice. Address, "ENGINEER,"
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By a man of 15 years' experience in the manufacture' distribution, construction and management of high and low pressure coal and water gas of various types. Would prefer charge of a plant west of Mississippi River. Salary regarded secondary matter. Able to accept after a 10-day notice. Address, "MIDDLE WEST,"
1872-1 Care this Journal.

Position as manager or superintendent of gas or electric company, by young man with practical experience in the manufacture and distribution of coal and water gas. Is familiar with electric generation and distribution. Can furnish any required references.

Address, "W. H.,"
1872-2 Care this Journal.

As CHIEF CLERK, MANAGER OF COMMERCIAL DEPARTMENT, or SUPERINTENDENT OF A SMALL GAS PLANT, by a young man with eight years' experience. Best of references furnished.

Address, "R. E. K.,"
1812-1 Care this Journal.

Experienced Gas Chemist wishes situation as Chemist in Charge of Manufacture or Superintendent of Gas Plant. Must be A-No. 1 position. Best of references given.

Address, "CHEMIST,"
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POSITIONS OPEN.

Wanted, SECOND MAN IN WATER GAS PLANT in Vermont. State age, references and wages required.

Address, "G. H. A.,"
1871-2 Care this Journal.

A WORKING FOREMAN for a small gas plant in Michigan. One who has experience in both coal and water gas plants preferred.

Address, "A. B. C.,"
1870-3 Care this Journal.

MISCELLANEOUS.

FOR SALE,

One 6-Foot United Gas Improvement Water Gas Set, Complete, which is sold for the purpose of making room for a larger installation The set is in perfect working order and prices will be quoted upon application. NEW BEDFORD GAS AND
1864-tf EDISON LIGHT CO., New Bedford, Mass.

Why Buy a New Set when this will tide you over until you require a larger one?

FOR SALE, one 6-foot U. G. I. water gas set, consisting of generator, carburetter, superheater, wash box, scrubber and condenser. In first-class condition. Has always given excellent results. Price $2,000 on board cars point of shipment.

Address, "BARGAIN,"
1869-4 Care this Journal.

FOR SALE,

ONE SEVEN-FOOT SIX-INCH U. G. I. WATER GAS SET.—This machine is complete with the exception of condenser, and is being replaced with larger apparatus. Immediate shipment can be made. Inquiries should be addressed to

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Springfield, Mass.
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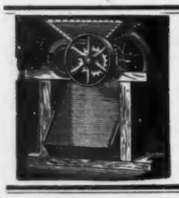

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Strong, Simple, Durable. Will Crush any Size Desired.
C. M. KELLER,
Columbus, Ind.
Correspondence Solicited.

BOOKS FOR GAS MEN.

MOTION STUDY, by Frank B. Gilbreth. 135 pages. Illustrated. Price, $2.
LIQUID AND GASEOUS FUELS, by Vivian B. Lewes. 334 pages. Price, $2.
THE GAS ENGINE, by Forrest R. Jones. 447 pages and 142 cuts. Price, $4.
HEATING, by W. J. Baldwin. Price, $2.50.
PUBLIC LIGHTING BY GAS and ELECTRICITY, by W. J. Dibdin. 528 pages. About 150 illustrations. Price, $8.
AUDEL'S GAS ENGINE MANUAL. 469 pages. 156 illustrations. Price, $2.
GAS MANUFACTURE, by W. J. A. Butterfield. Price, $2.50.
HANDBOOK ON GAS ENGINES, by G. E. Lieckfeld, C.E. Translated by George M. Richmond, M.E. Price, $1.
GAS AND GAS WORKS, by Hughes and O'Connor. Price, $2.50.
CHEMISTRY OF GAS MANUFACTURE, by Harold M. Royle, F.C.S. Price, $4.50.
MODERN COKING PRACTICE, by T. H. Byrom and J. E. Christopher. 168 pages. Illustrated. Price, $3.50.
HEAT ENERGY AND FUELS, by Oskar Nagel. 306 pages and 118 illustrations. Price, $3.

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AMERICAN GAS LIGHT JOURNAL, 42 Pine St., N. Y. City.

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Chester, Pa.,

Manufacturers of Genuine Wrought Iron Pipe.

Design 33103. Design 33514.

POSTS

FOR

LOW

AND

HIGH PRESSURE LIGHTING

The height of a post is determined by the type of lamp and the distance between posts. These details are all of considerable importance, and our experience and judgment are at your service.

Our plant at Frederick, Md., has a capacity of 75 tons per day.

SEND FOR BULLETIN 20.

THE MORRIS IRON CO.

"The Outdoor Lighting Specialty House."

91 WEST ST., NEW YORK CITY.

PAINT YOUR HOLDER.

Get a supply of the best paint made---Atlas Preservative---and make your men get busy with the steel brush to remove the rust, then employ some of your partly idle men to put the paint on.

Good paint is the cheapest thing you can buy. We make no other kind. It costs you only $1.50 per gallon, delivered in barrel lots.

You can use the last drop in the barrel, and every drop is good.

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COMPANY,
NASHVILLE,
TENNESSEE.

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GENERAL MANAGER.

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Get some of our meter enamel. Try our brickwork decorator. We make every kind of paint a gas company needs.

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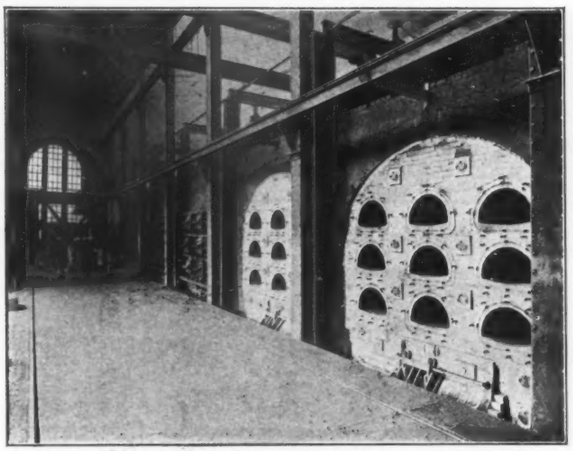

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Some kinds of manufactured products simply represent a lot of material upon which labor has been expended. They are bad bargains, at any price.

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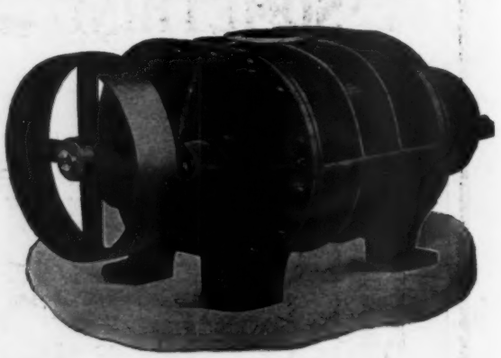

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Lamp is made of heavy sheet steel porcelain enameled throughout.

Slidable Chimney perfectly protects mantle when globe is removed for cleaning.

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Gas Consumption, 3 feet per hour. Candle power, 119.

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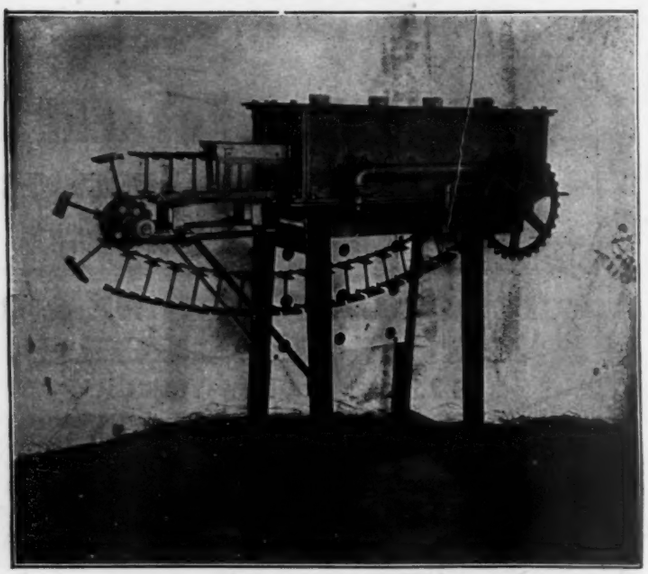

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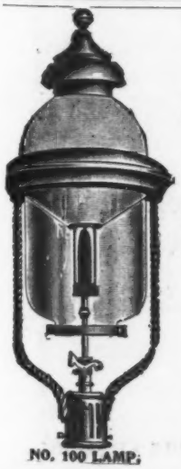

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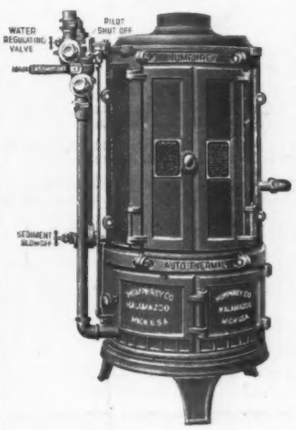

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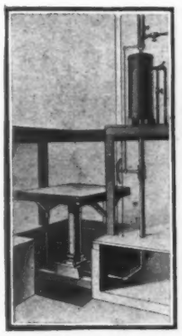
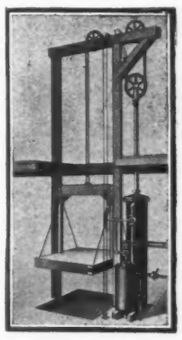
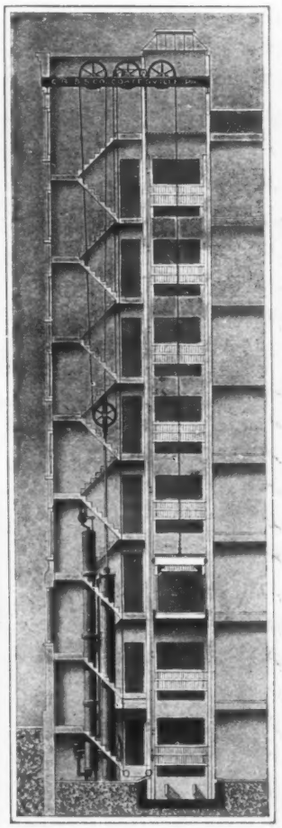


THE GAS MAN'S PET.





MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

American Gas Institute.—Annual meeting, October 18, 19, 20, 21, 1911. St. Louis, Mo. Officers: President, Donald McDonald, Louisville, Ky. Secretary, A. B. Beadle, 29 West 39th st., N. Y. City.

Canadian Gas Association.—Annual meeting, June, 1911. ————. Officers President, Arthur Hewitt, Toronto, Ont.; Secretary and Treasurer, John Keillor, Hamilton, Ont.

Empire State Gas and Electric Association.—Annual meeting, Nov., 1911. New York City. Officers: President, C. R. Huntley, Buffalo, N. Y.; Secretary, C. H. B. Chapin, 29 W. 39th street, New York City.

Guild of Gas Managers of New England.—Annual meeting, December. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, A. K. Quinn; Newport, R. I.; Secretary, Walter G. Africa, Manchester, N. H.

Illinois Gas Association.—Annual meeting, time, March, Chicago, Ills. Officers: President, C. B. Strohn, Elgin, Ills.; Secretary-Treasurer, H. E. Newberry, Dixon, Ills.

Illuminating Engineering Society.—Annual meeting, Oct., Chicago, Ill., 1911. Meetings of Sections, monthly. Pres't, A. E. Kennelly, Boston, Mass.; Secretary, Preston S. Millar, 29 W. 39th street, N. Y. City. Sections: New York: Secretary, Albert J. Marshall, 36 West 39th street. New England, Secretary, W. S. Farrow, 1240 Massachusetts avenue, Cambridge, Mass. Philadelphia, Secretary, G. B. Muth, 1000 Chestnut street Chicago, Secretary, F. H. Bernhard, Marquette Building.

Indiana Gas Association.—Annual meeting, Jan. 17 and 18, 1912, Indianapolis. Officers: President, S. E. Mulholland, Fort Wayne; Vice-President, Howard L. Olds, Indianapolis; Secretary-Treasurer, Philmer Eves, Indianapolis.

Iowa District Gas Association.—Annual meeting, time, June, 1911, ————. Officers: President, Austin Burt, Waterloo, Ia.; Secretary and Treasurer, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, time, ———— Wichita, Kas. Officers: President, W. A. Scothorn, Hutchinson, Kas.; Secretary and Treasurer, J. D, Nicholson, Newton, Kas.

Michigan Gas Association—Annual meeting, time, Sept. 20, 21, 22, 1911; Detroit, Mich. Officers: President, A. P. Ewing, Detroit, Mich.; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April 13 14 and 15, 1911; St. Louis, Mo. Officers: President, R. J. Irvine; Secretary and Treasurer, W. J. Cunningham, Springfield, Mo.

National Commercial Gas Association.—Annual meeting, October 23-28 1911. Denver, Officers: President, C. N. Stannard, Denver; Secretary, Louis Stotz, 39 West 39th street, New York City.

Natural Gas Association.—Annual meeting, May 16, 17 and 18, 1911; Pittsburgh, Pa. Officers: President, John M. Garard, Columbus, O, Secretary, T. C. Jones, Delaware, O. Editor Wrinkle Department, F. W. Stone, Ashtabula, O.

New England Gas Association.—Annual meeting, third Wednesday in February, 1911; Boston. Officers: President, W. H. Snow, Holyoke, Mass.; Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

Oklahoma Public Utilities Association.—Annual meeting, May 9, 10 and 11, 1911. Officers: President, E. C. Reynolds; Secretary, Galen Crow, Guthrie, Okla.

Pacific Coast Gas Association.—Annual meeting, Sept. 20, 21 and 22, 1911, Oakland Cal. Officers: President, F. A. Leach, Jr., Oakland, Cal.; Vice P esident, W. Baurhyte, Los Angeles, Cal.; Secretary-Treasurer, John A. Britton, 445 Sutter street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, April, 1912, Williamsport, Pa. Officers: President, C. W. Butterworth, Millon, Pa; Secretary-Treasurer, William H. Merritt. Lebanon, Pa.

Society of Gas Lighting.—Annual meeting, December, 1911; monthly meeting, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramadell, Waterbury, Conn.

Southern Gas Association.—Annual meeting, April 19-21, 1911, Montgomery, Ala. Officers: President, H. W. Frund, Salisbury, N. C.; Secretary-Treasurer, Jas. Ferrier, Rome, Ga.

Southwestern Electrical and Gas Association.—Annual meeting. April 27, 28, 29, 1911; Houston, Tex. Officers: President, W. B. Tuttle, San Antonio, Tex.; Secretary, D G. Fisher, Dallas, Tex.

Wisconsin Gas Association.—Annual meeting, May 17 and 18,, 1911, Milwaukee, Wis. Officers: President, W. H. Winslow, Superior, Wis.; Secretary-Treasurer, Henry Harmon, Milwaukee, Wis.

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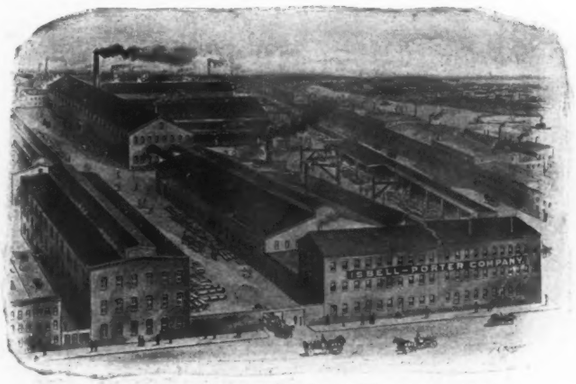

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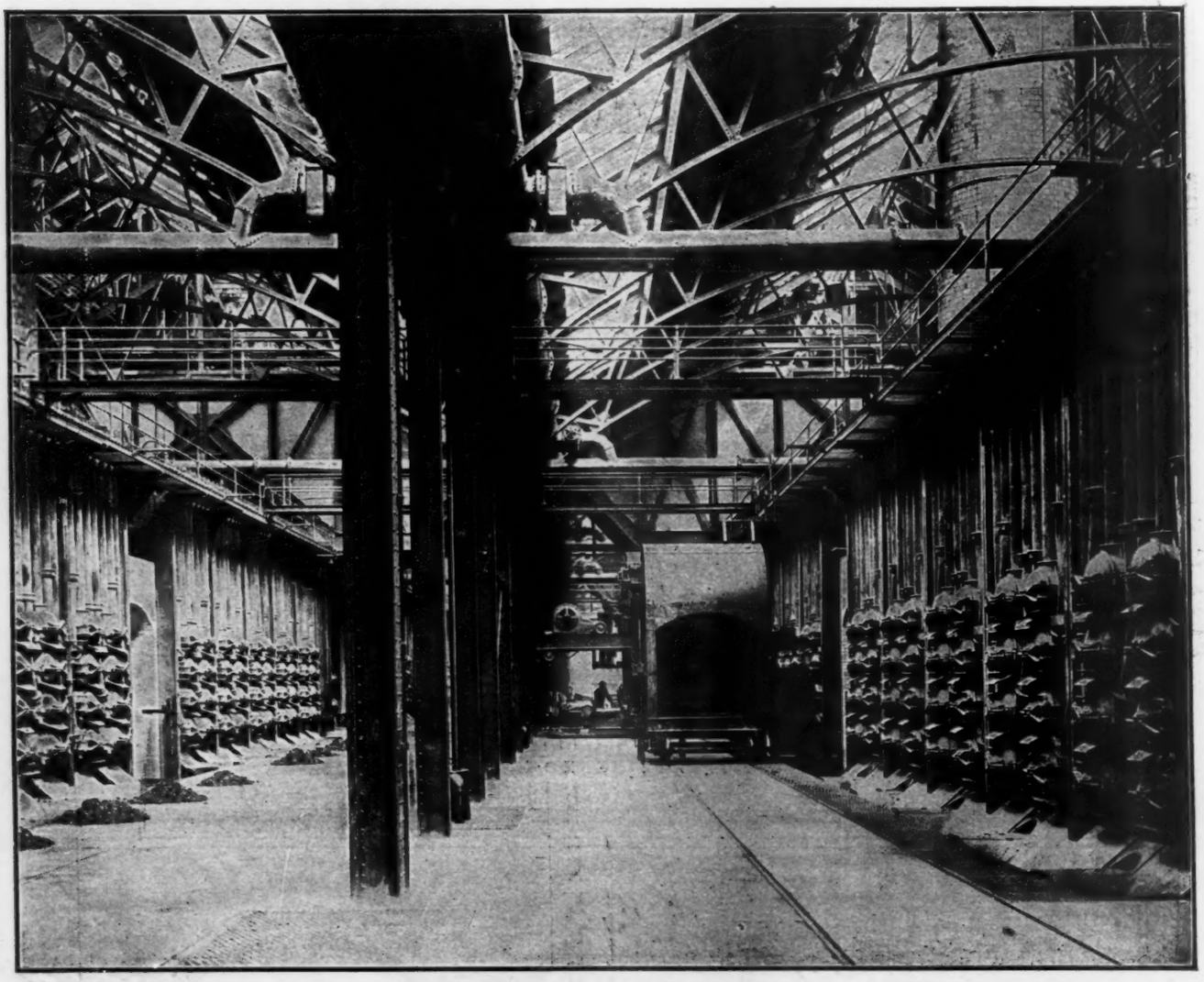

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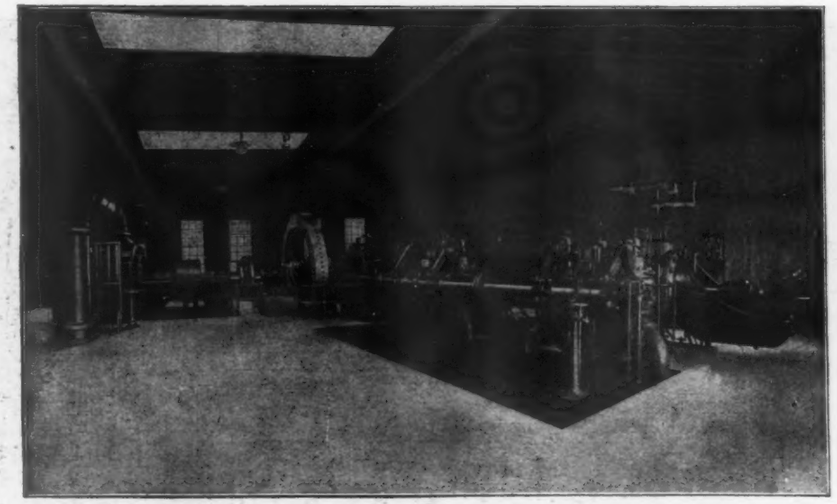
A half century of experience, up-to-date engineering and shop facilities embodied in these **World Famous Gas Exhausters.**



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—AND—

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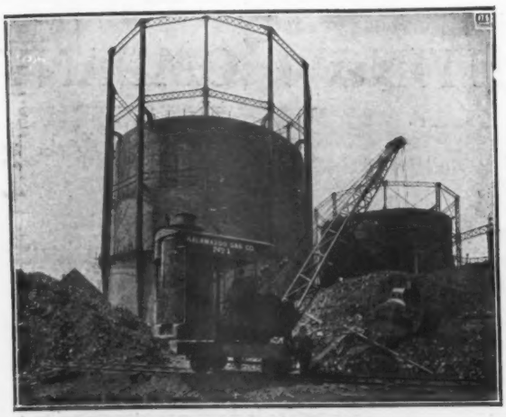
Mr. L. C. Hamlink has been elected Vice-President of The Gas Machinery Company and will have charge of the furnace department, with headquarters at the main office in Cleveland, O.

An office will be maintained in St. Louis and Mr. August Court, who is Secretary of The Gas Bench Construction Company, will be in charge. The best qualities of either silica or clay materials will be furnished in both retorts and settings.

THE GAS MACHINERY CO.
CLEVELAND, OHIO.



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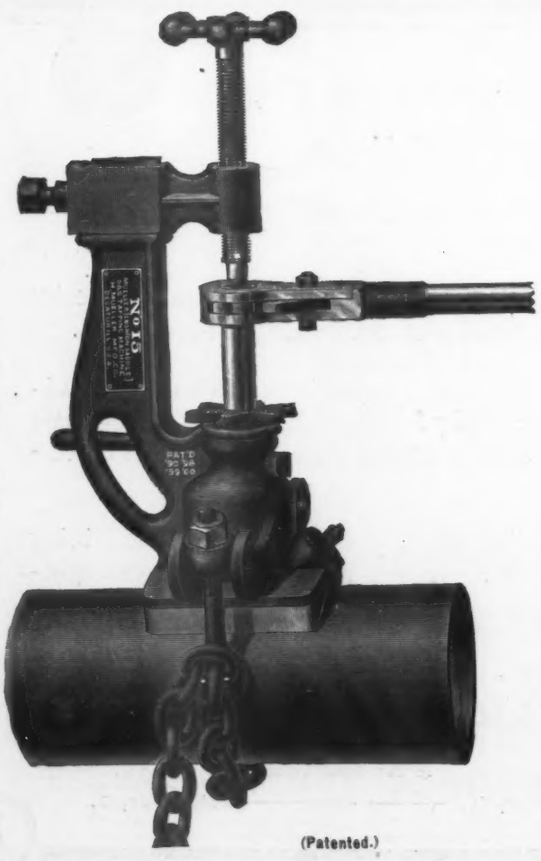

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Get Speed, Convenience And Strength Combined.

That is what Mueller Gas Tapping Machines will give you. These were qualities kept in mind when they were designed and faithfully followed in the building.

You have a line of eight tapping and two drilling machines to select from.

The No. 15 Mueller Gas Tapping Machine here shown is in one piece and the chain is attached. The body has a hand hold for carrying. It will make taps from ⅝ to 2-inch in mains of any size under pressure.

Sent on thirty days' free trial and Unconditionally Guaranteed.

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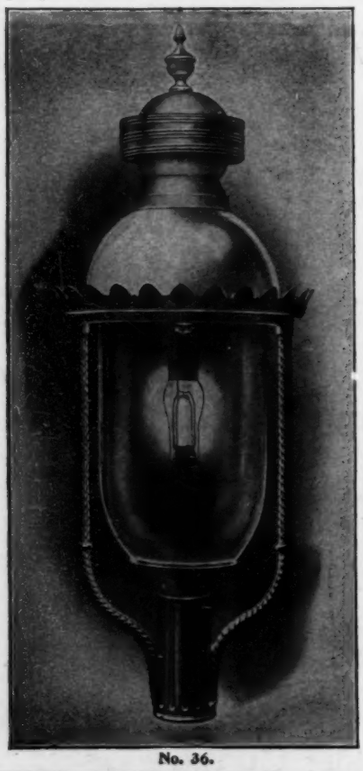
NEW YORK, 318 West 42d Street. BOSTON, 820 Beacon Building. PHILADELPHIA, Broad and Arch Streets. ST. LOUIS, 712 Roe Building. CHICAGO, 218 La Salle Street. SAN FRANCISCO, 512 Oak Street.

WELSBACH STREET LIGHTING COMPANY



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....OF AMERICA....

Controls and Operates the **Welsbach System of Street Lighting,**

Which includes its specially DESIGNED and PATENTED BURNER for PARK LIGHTING exclusively.

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By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

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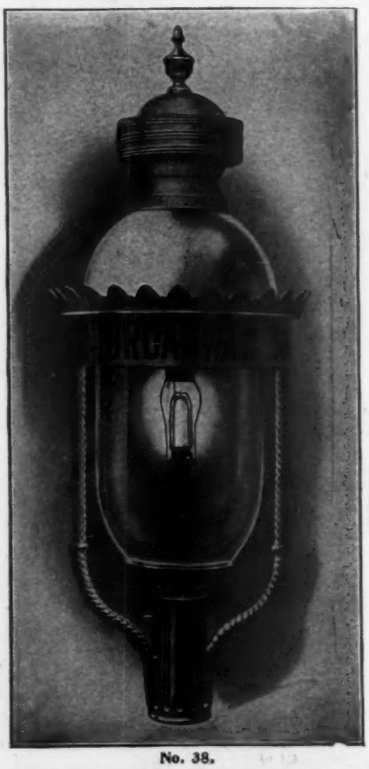
IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

Correspondence Solicited from Gas Companies and Others interested in Municipal and Outside Lighting.



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ARTISTIC LIGHTING FOR SHOE STORES.

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Artistic lighting fixtures provide one of the really few opportunities of decoration for such stores.

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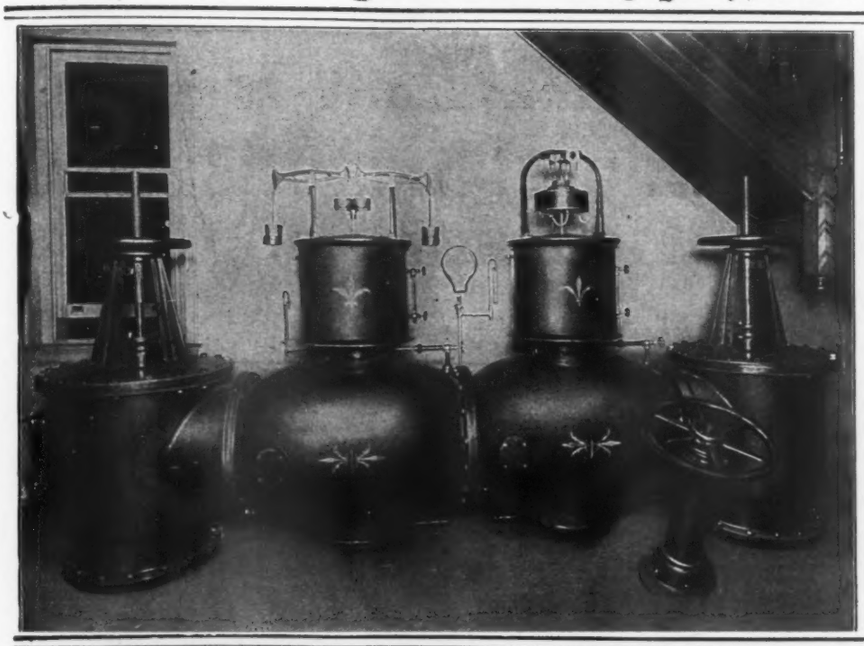

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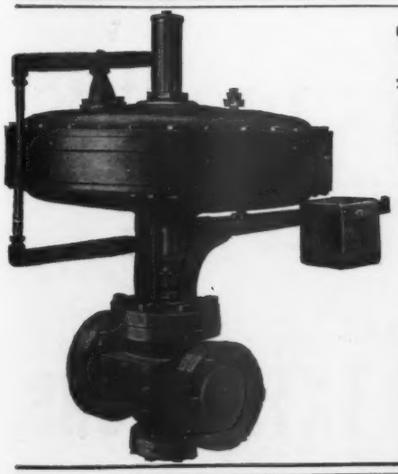

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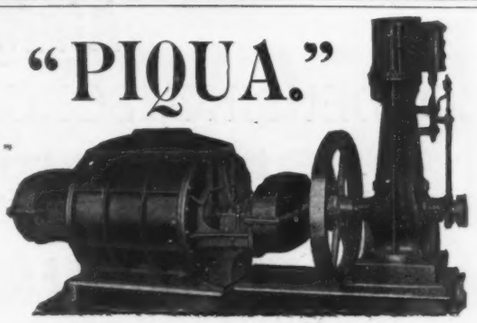

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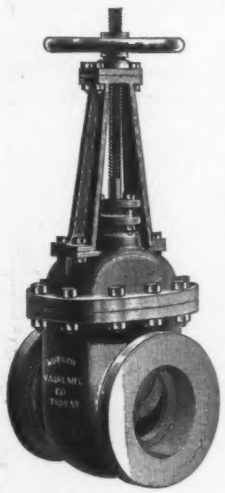

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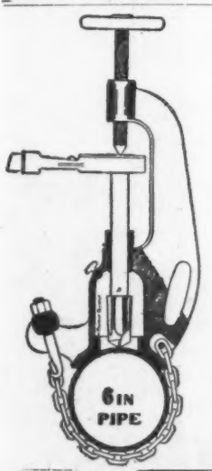

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WITHOUT ANY ESCAPE OF G'S.

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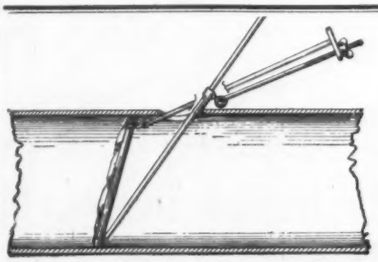

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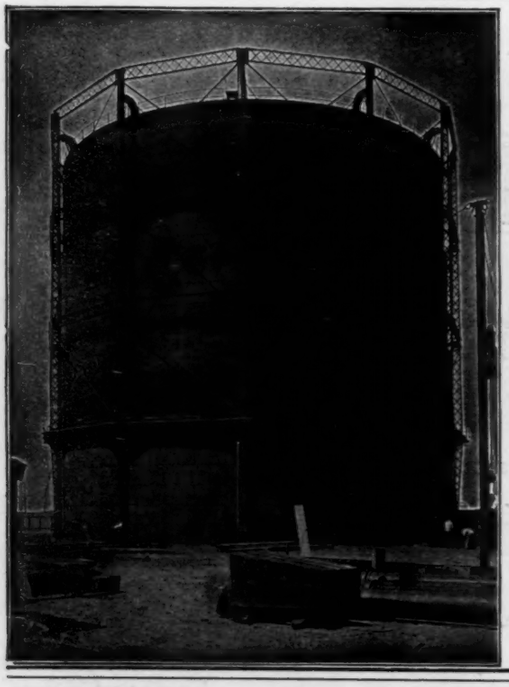

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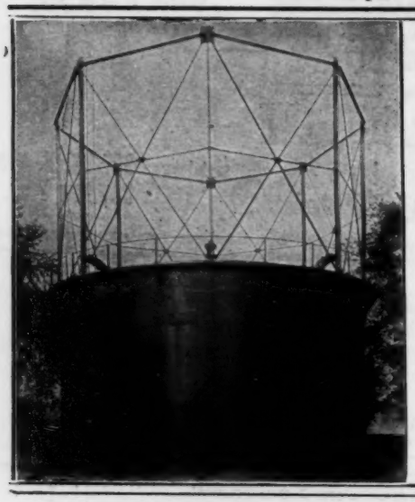

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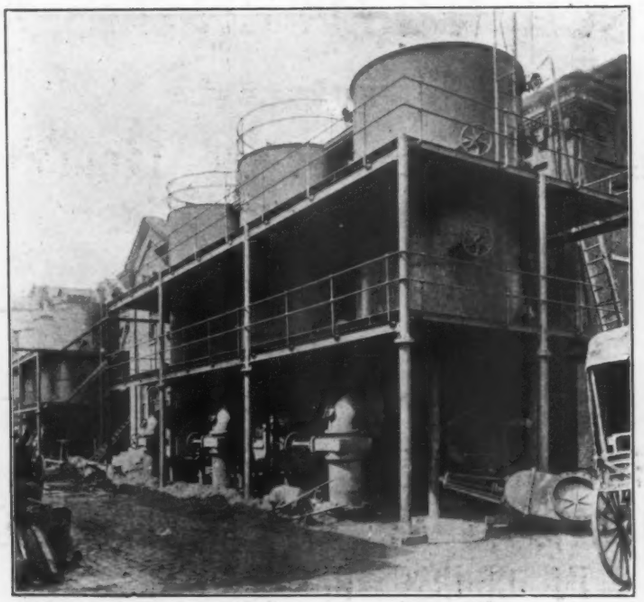

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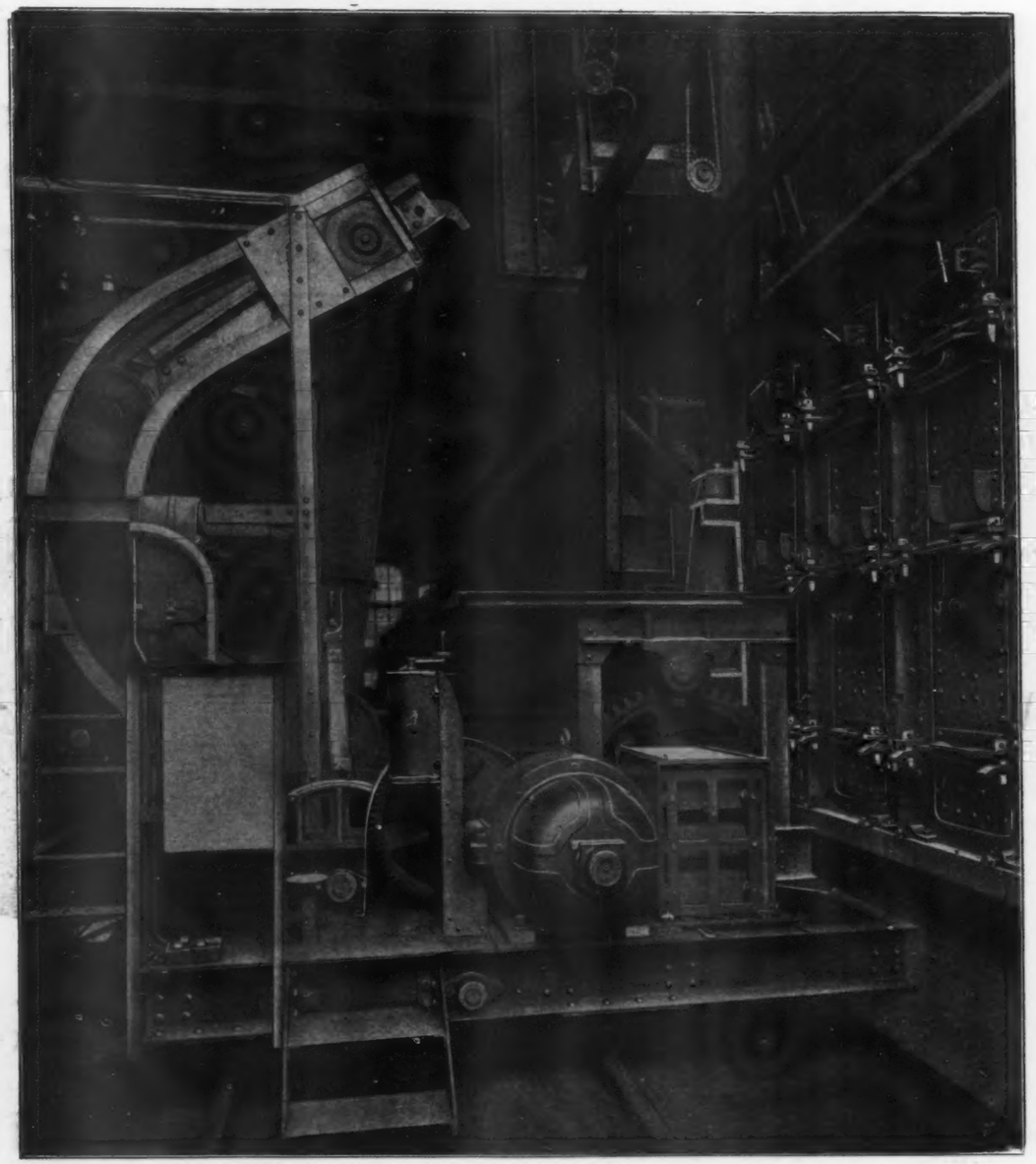

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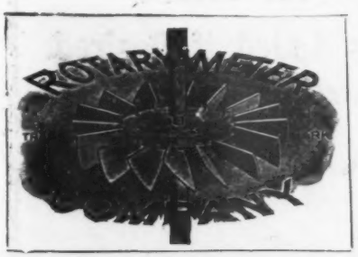

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Natural and Artificial Gas Meters, also Station Meters, Provers, Portable Test Meters, and all other appliances.

The Pioneers of Large Capacity Meters for Natural and Artificial Gas.

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SOLE AGENTS FOR THE MIDDLE WEST: The National Supply Co. of Kansas, Independence, Kas.

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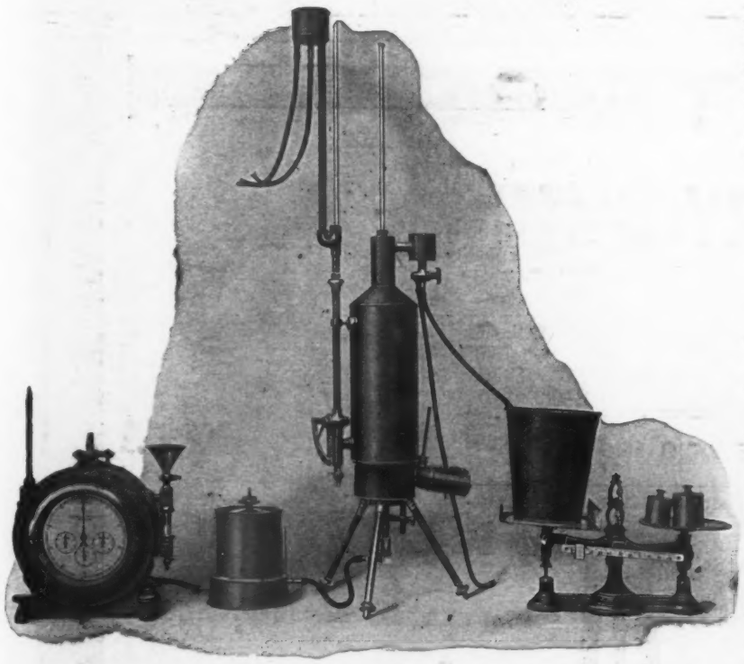
NEW YORK. PHILADELPHIA. CHICAGO.

THE AMERICAN METER CO.

ESTABLISHED 1884.

"WE AIM TO PLEASE."

WET and DRY GAS METERS,



Experimental and Station Meters, Pressure Gauges, Meter Provers, Drip Pumps, Service Cleaner Pumps, Service and Meter Cocks, Lamp Cocks and Torches, Photometrical Apparatus and all articles for the distribution, measurement and testing of gas.

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Sole Manufacturer of the

HINMAN CALORIMETER.

This apparatus is of the same general design and operates on the same principle as the well-known Junkers Calorimeter, which has heretofore been regarded by gas experts as the most satisfactory form of calorimeter in use.

We have, however, made some valuable improvements in the instrument, with a view to overcoming certain troublesome features in the original, making it easier to operate, and we find these improvements very acceptable to users of the calorimeter.

This Calorimeter, with its accessories, is constructed in accordance with the recommendations made by the Committee on Calorimeters of the American Gas Institute. It also has the approval of the Public Service Commission of the Second District, Albany, and has been found by them to give accurate results.

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PREPAYMENT GAS METERS.

Our Own Patents. Strong. Simple. PROMPT ATTENTION CORRESPONDENCE SOLICITED.

COX'S LOW PRESSURE COMPUTER, - - - - $2.50
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EASTERN OFFICE NEW YORK CITY. WESTERN OFFICE SAN FRANCISCO.

Broad Exchange Building. 931 Indiana Street.

IT IS SALES THAT COUNT.

The following list shows in what respect our Valves are held by six representative concerns. In every instance the original order was followed by repeat orders:

	1908.	1909.	1910.	Total.
Westinghouse Machine Co.		$1,746	$3,085	$4,831
H. Koppers			7,095	7,095
U. S. Steel Corporation	$19,951	353	37,917	58,221
Los Angeles Gas & Elec. Co.		1,808	7,979	9,787
Milwaukee Coke & Gas Co.		3,017	271	3,288
East St. Louis Gas Co.			2,267	2,267
				$85,489

(There are others.)

Made in sizes from 4-inch to 72-inch.
Once used---indispensable.

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EVERYTHING FOR A GAS PLANT